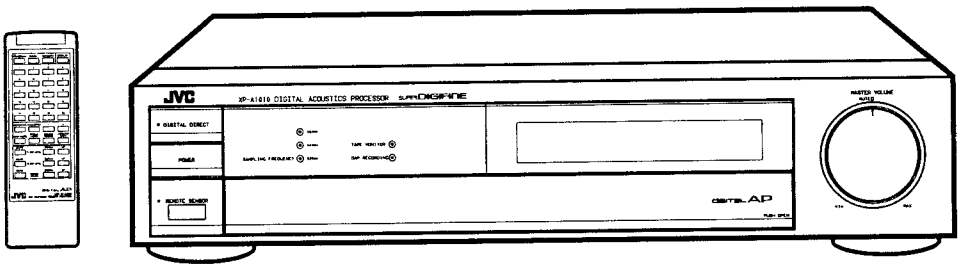
JVC

SERVICE MANUAL

MODEL NO. XP-A1010TN



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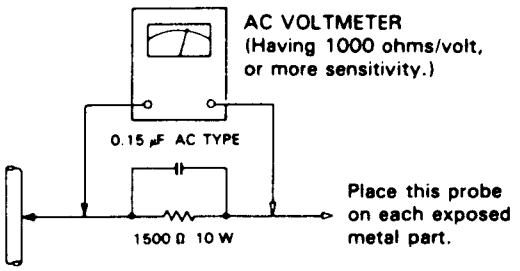
No. 20120
Jun. 1989

Safety Precautions

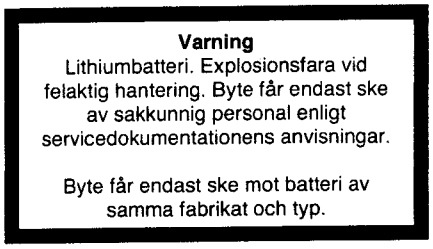
1. The design of this product contains special hardware and many circuits and components specially for safety purposes. For continued protection, no changes should be made to the original design unless authorized in writing by the manufacturer. Replacement parts must be identical to those used in the original circuits. Service should be performed by qualified personnel only.
2. Alterations of the design or circuitry of the product should not be made. Any design alterations of the product should not be made. Any design alterations or additions will void the manufacturer's warranty and will further relieve the manufacturer of responsibility for personal injury or property damage resulting therefrom.
3. Many electrical and mechanical parts in the product have special safety-related characteristics. These characteristics are often not evident from visual inspection nor can the protection afforded by them necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in the Parts List of Service Manual. Electrical components having such features are identified by shading on the schematics and by (⚠) on the Parts List in the Service Manual. The use of a substitute replacement which does not have the same safety characteristics as the recommended replacement part shown in the Parts List of Service Manual may create shock, fire, or other hazards.
4. The leads in the products are routed and dressed with ties, clamps, tubings, barriers and the like to be separated from live parts, high temperature parts, moving parts and/or sharp edges for the prevention of electric shock and fire hazard. When service is required, the original lead routing and dress should be observed, and it should be confirmed that they have been returned to normal, after re-assembling.
5. Leakage current check (Electrical shock hazard testing)
   After re-assembling the product, always perform an isolation check on the exposed metal parts of the product (antenna terminals, knobs, metal cabinet, screw heads, headphone jack, control shafts, etc.) to be sure the product is safe to operate without danger of electrical shock.
   Do not use a line isolation transformer during this check.
   - Plug the AC line cord directly into the AC outlet. Using a "Leakage Current Tester", measure the leakage current from each exposed metal part of the cabinet, particularly any exposed metal part having a return path to the chassis, to a known good earth ground. Any leakage current must not exceed 0.5 mA AC (r.m.s.).
   - Alternate check method
     Plug the AC line cord directly into the AC outlet. Use an AC voltmeter having 1,000 ohms per volt or more sensitivity in the following manner. Connect a 1,500 Ω 10 W resistor paralleled by a 0.15 μF AC-type capacitor between an exposed metal part and a known good earth ground.
     Measure the AC voltage across the resistor with the AC voltmeter.
     Move the resistor connection to each exposed metal part, particularly any exposed metal part having a return path to the chassis, and measure the AC voltage across the resistor. Now, reverse the plug in the AC outlet and repeat each measurement. Any voltage measured must not exceed 0.75 V AC (r.m.s.). This corresponds to 0.5 mA AC (r.m.s.).

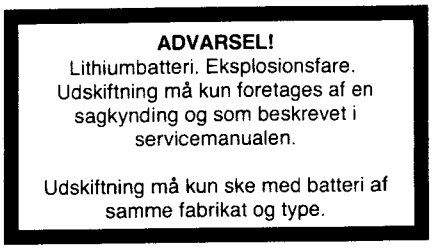

AC VOLTMETER
(Having 1000 ohms/volt, or more sensitivity.)
0.15 μF AC TYPE
1500 Ω 10 W
Place this probe on each exposed metal part.
Good earth ground

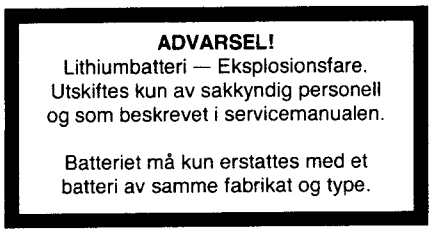
Warning

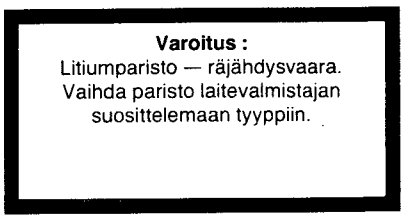
1. This equipment has been designed and manufactured to meet international safety standards.
2. It is the legal responsibility of the repairer to ensure that these safety standards are maintained.
3. Repairs must be made in accordance with the relevant safety standards.
4. It is essential that safety critical components are replaced by approved parts
5. If mains voltage selector is provided, check setting for local voltage.

Lithium Battery Cautions


Varning
Lithiumbatteri. Explosionsfara vid felaktig hantering. Byte får endast ske av sakkunnig personal enligt servicedokumentationens anvisningar.
Byte får endast ske mot batteri av samma fabrikat och typ.


ADVARSEL!
Lithiumbatteri. Eksplosionsfare. Udskiftning må kun foretages af en sagkynding og som beskrevet i servicemanualen.
Udskiftning må kun ske med batteri af samme fabrikat og type.


ADVARSEL!
Lithiumbatteri — Eksplosionsfare. Utskiftes kun av sakkyndig personell og som beskrevet i servicemanualen.
Batteriet må kun erstattes med et batteri av samme fabrikat og type.



Warning

Lithium battery. Danger of fire or explosion if handled careless.
May be replaced trained personnel only according to the service manual.

For battery replacement

1. Replace battery, BT601, with JVC Part No. CR2032-FT6, nominal voltage 3V, only. Use of another battery may present risk of fire or explosion.
2. Solder within 5 seconds when the temperature of the soldering iron tip is 350°C, within 10 seconds when the temperature is 250°C.
3. Always use a terminal to solder. Never solder directly to the battery body.

Cautions on Battery Handling

1. Do not pile batteries one on the other or heap them together so that the + and – terminals come into contact, and do not touch them to metals.
2. Do not expose the batteries to heat.
3. Do not take the batteries apart or subject them to shock.
4. Do not charge the batteries.

Service Precautions

1. When repairing the DSP board, remove the black wire (J606) of the backup circuit and discharge C616 using a resistance of about 1K ohm 1/4W to prevent damage to the microcomputer (IC601).

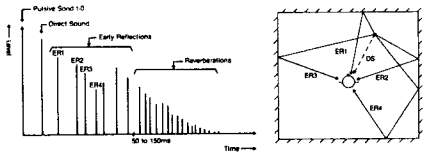
2. When removing the flat cable of the FL display tube (CN1, J605), turn the power off and discharge C102, C103 and C104 using a resistance of about 1K ohm 1/4W to prevent damage to the microcomputer in the FL.

DIGITAL ACOUSTICS PROCESSOR (DAP)

Music from your stereo is more enjoyable when it faithfully reproduces the original performance and creates the feeling of a live performance (sound-field creation). The JVC Digital Acoustics Processor (DAP) makes that performance possible.

The sound patterns comprising a sound field is classified into three types of sound:

- Direct sound from the sound source
- Reflected sound from wall and ceiling
- Reverberating sound, repetition of reflected sound

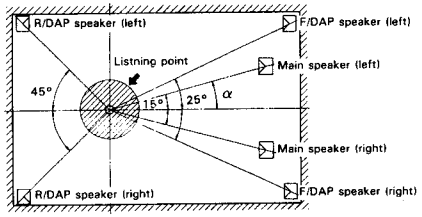


These three types of sound vary depending upon the size and shape of the performance place, the wall and ceiling material, the positions of musicians and the audience.

The characteristic sound of a famous concert hall is produced by the balance of these three elements created in the structure of the concert hall.

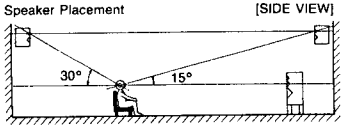
Music playedback from your audio device can be enjóyed with the feeling of a live performance by adding two or four dedicated speakers (other than two front speakers) to reproduce the reflected and reverberating sound of a concert hall.

THE OPTIMUM POSITION OF DEDICATED SPEAKERS



When using this equipment in a four-channel system (with main speakers and rear speakers alone), allow a little wider separation between the main speakers. (It is recommended that angle α be about 20°.)

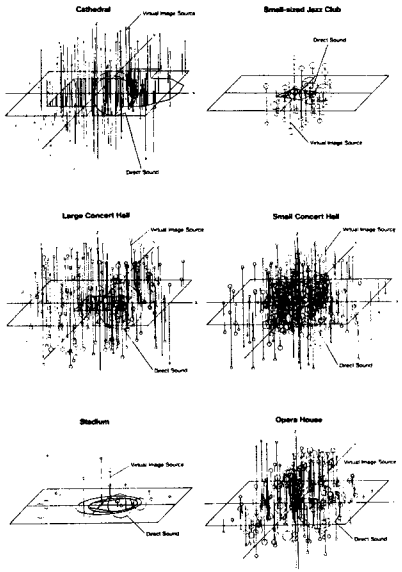
Speaker Placement [SIDE VIEW]



The JVC DAP reproduces the sound-field patterns of a live performance (the reflected sound that a listener hears from various directions) using the most recent digital technology. It allows you to enjoy the effect of a live performance by reproducing, in your listening room, the sound field of a jazz club, concert hall or church.

The DAP is programmed with 20 patterns of sound fields from such places as a concert hall, recital hall, church, cathedral, jazz club and a stadium. The sound field data pattern was collected using the new "Symmetrical 6-point sound-field analyzing method". From these 20 patterns you can select the optimum sound field for the playback program according to the style of music you listen to.

Symmetrical 6-Point Sound Field Analysis Pattern



Also, when loading a programmed pattern, temporary changes can be made in the parameters* of these programs. You can create your own sound-field patterns by changing the parameters and then saving the new sound-field pattern in one of the 20 manual-program memory locations.

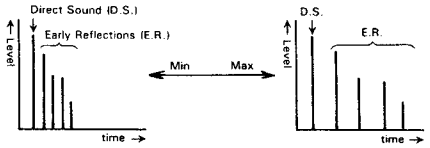
* Refer to page 6.

PARAMETERS

The 20 programs contain the sound field parameters of each performance site. This sound-field data was collected using the symmetrical 6-point sound-field analyzing method. You can create your own original sound field by changing one or more of these sound field parameters:

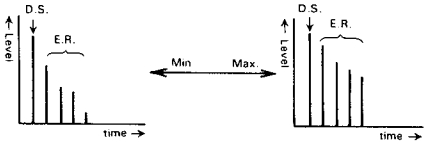
1. ROOM SIZE

The data on the size of a performance site is programmed as a standard value of 1.0.
You can change this parameter from 0.5 (1/2) to 2 (double-size room).
As the value of the parameter increases, the apparent size of the performance site gets larger.



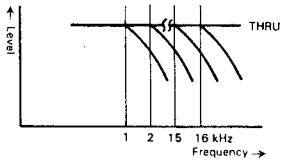
2. LIVENESS

The reflection rate measured in a performance site is programmed as a standard value of 1.0.
You can change this parameter between 0.5 (1/2) and 2 (double).
As the value of the parameter increases, the performance site is given greater reflections.



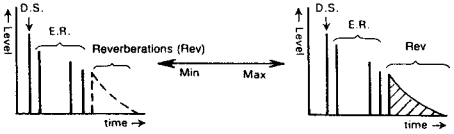
3. LPF

Indicates the frequency characteristics of the total reflected sound. The programmed standard value varies depending upon the performance site.
You can change this parameter between flat and a cut-off frequency of 1 kHz.
As the value of the parameter increases, the reflections of the high frequency region are further emphasized for the performance site.



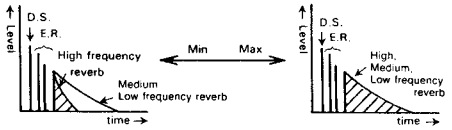
4. REVERB LEVEL

Controls the reverberating sound level. The data of each performance site is programmed as a standard value of 1.0.
You can change this parameter between 0 (none) and 2 (double)
As the value of the parameter increases, the performance site is given more reverberations.



5. HF REVERB

Controls the reverberation time characteristics at high frequencies. The value of 1.0 is the same rate as the middle frequency reverberation time characteristic.
You can change this parameter between 0.1 and 1.0 (double).
The standard value varies depending upon the performance site.
As the value of the parameter increases, the apparent quality of the walls, ceiling and other parts of the performance site becomes harder.

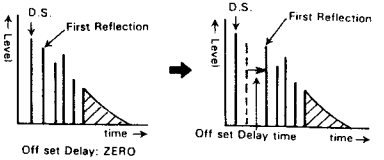


6. REAR DELAY (Preset 16 — 20 only)

Sets the delay time of the R/DAP output signals (the rear speakers) delayed from the main signals. You can change this parameter from the standard value of 20 msec to between 15 and 30 msec.

7. OFFS DELAY

Sets the output delay time of the F/DAP (front speakers) and R/DAP (rear speakers) signals delayed from the main signals in order to compensate the time delay between digital input signal and analog output signal of an amplifier with D/A converter. You can change this parameter from the standard value of 0, up to 200 msec. Set the maximum value only when using the DAP in digital direct mode.



Note:

i. When you select analog input signals, you do not need to use this parameter.
ii. R/DAP output of preset No. 16—19 cannot be compensated by this parameter.

CONNECTION AND PREPARATIONS

Connect the cables; set and adjust the switches according to the connected audio equipment and the speaker arrangement (four channels or six channels). Use the following tables to guide your setup:

When Using an Analog Amplifier for the Main Signal (Source Playback):

Turn the DIGITAL DIRECT switch OFF (analog).

Amplifier and input terminal / Speaker arrangement and switch operation	Separate amplifier	Pre-Main Amplifier	
		With PREOUT-MAIN IN terminal	With TAPE MONITOR terminal
6 CHANNEL	Fig. A	Fig. B	Fig. C
DAP MODE switch ㉙	6 CH (▬)	6 CH (▬)	6 CH (▬)
4 CHANNEL	Fig. A	Fig. B	Fig. C
DAP MODE switch ㉙	4 CH (▬)	4 CH (▬)	4 CH (▬)

When Using a Digital Amplifier (with D/A Converter) for the Main Signal (Source Playback):

Turn the DIGITAL DIRECT switch ON (digital).

When connecting a digital amplifier with a larger delay time between input and output, set the OFFSET DELAY TIME of this unit to match the delay time of the digital amplifier in order to create a proper sound field.

Amplifier and input terminal / Speaker arrangement and switch operation	Pre-Main Amplifier				Separate amplifier	
	with TAPE MONITOR terminal		With PREOUT-MAIN IN terminal			
	OPTICAL	COAXIAL	OPTICAL	COAXIAL	OPTICAL	COAXIAL
6 CHANNEL	Fig. D		Fig. E		Fig. F	
DAP MODE switch ㉙	6 CH (▬)		6 CH (▬)		6 CH (▬)	
OPTICAL / COAXIAL Selection switch ㉛						
4 CHANNEL	Fig. D		Fig. E		Fig. F	
DAP MODE switch ㉙	4 CH (▬)		4 CH (▬)		4 CH (▬)	
OPTICAL / COAXIAL Selection switch ㉛						

USING ANALOG SEPARATE TYPE AMPLIFIER

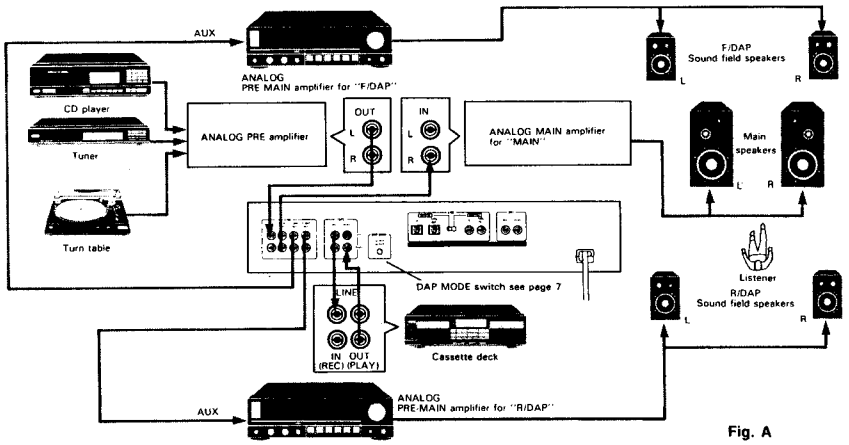


Fig. A

	Amplifier for "F/DAP"	"F/DAP" speakers
4 channel mode	not used	not used
6 channel mode	Connect to F/DAP out	Connect to the amplifier for "F/DAP"

USING PRE-MAIN AMPLIFIER WITH PREOUT MAIN IN TERMINAL FOR "MAIN"

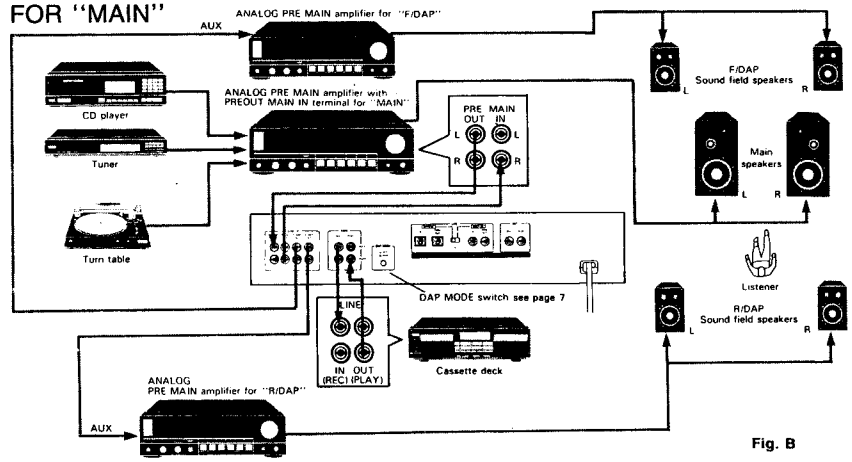


Fig. B

	Amplifier for "F/DAP"	"F/DAP" speakers
4 channel mode	not used	not used
6 channel mode	Connect to F/DAP out	Connect to the amplifier for "F/DAP"

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USING PRE-MAIN AMPLIFIER WITH TAPE MONITER TERMINAL, FOR "MAIN"

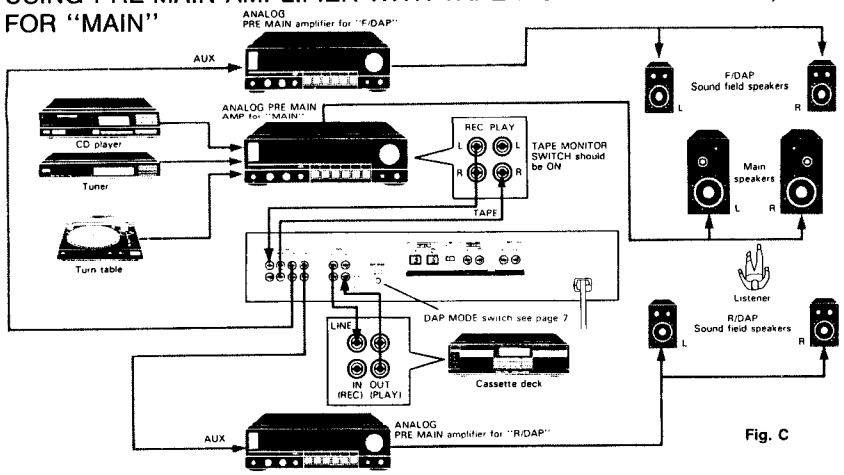


Fig. C

	Amplifier for "F/DAP"	"F/DAP" speakers
4 channel mode	not used	not used
6 channel mode	Connect to F/DAP out	Connect to the amplifier for "F/DAP"

USING AMPLIFIER WITH D/A CONVERTER AND TAPE MONITOR, FOR "MAIN"

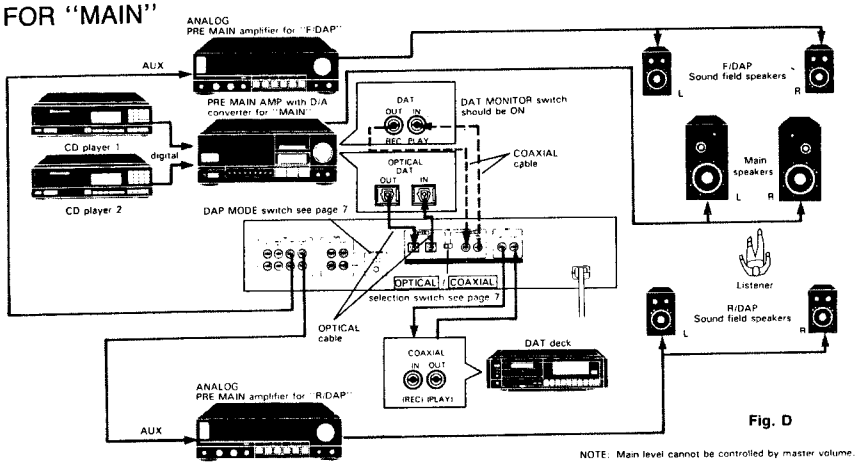


Fig. D

NOTE: Main level cannot be controlled by master volume.

	Amplifier for "F/DAP"	"F/DAP" speakers
4 channel mode	not used	not used
6 channel mode	Connect to F/DAP out	Connect to the amplifier for "F/DAP"

USING AMPLIFIER WITH D/A CONVERTER AND PREOUT-MAIN IN TERMINAL FOR "MAIN"

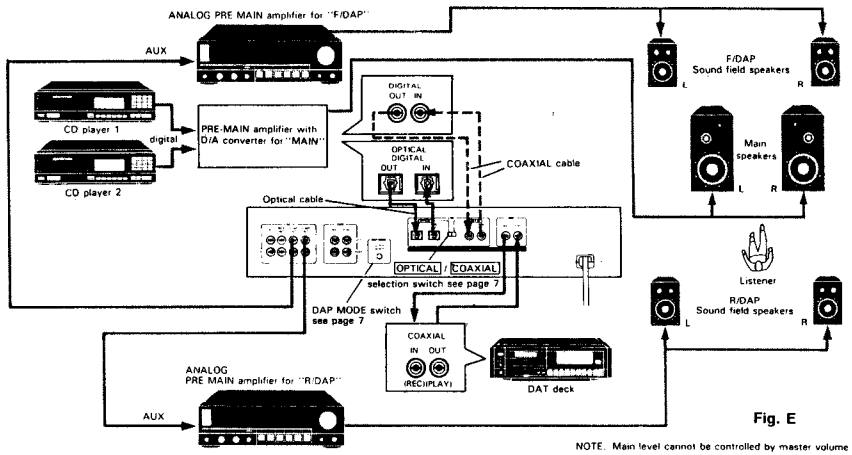


Fig. E

NOTE: Main level cannot be controlled by master volume

	Amplifier for "F/DAP"	"F/DAP" speakers
4 channel mode	not used	not used
6 channel mode	Connect to F/DAP out	Connect to the amplifier for "F/DAP"

USING SEPARATE TYPE AMPLIFIER WITH D/A CONVERTER, FOR "MAIN"

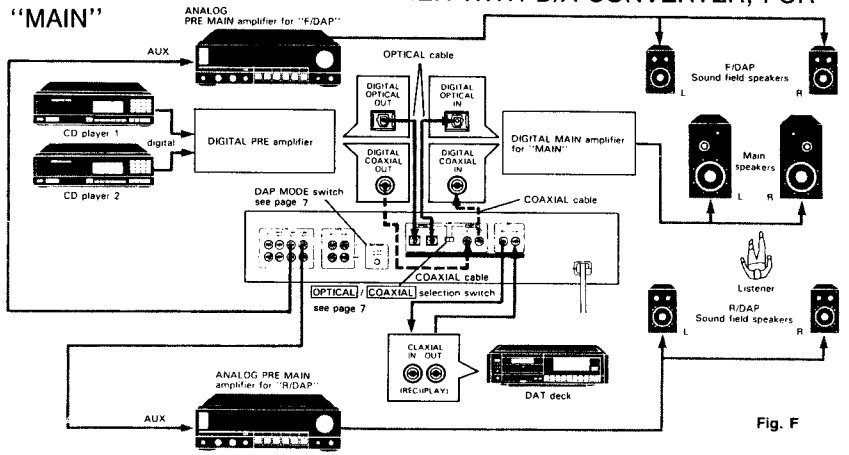
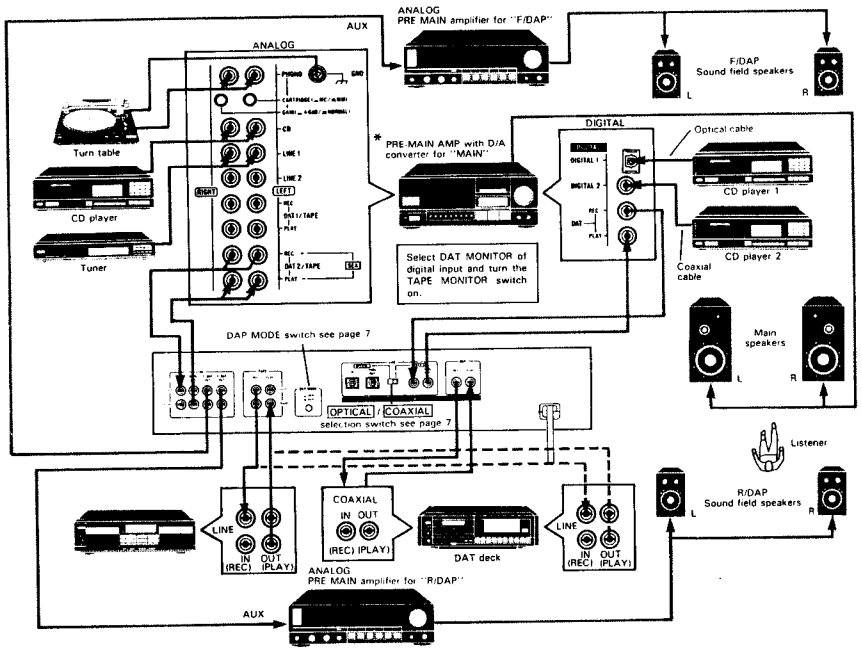


Fig. F

NOTE: Main level cannot be controlled by master volume

	Amplifier for "F/DAP"	"F/DAP" speakers
4 channel mode	not used	not used
6 channel mode	Connect to F/DAP out	Connect to the amplifier for "F/DAP"

USING A JVC AMPLIFIER WITH D/A CONVERTER AND TAPE MONITOR, FOR "MAIN"



	Amplifier for "F/DAP"	"F/DAP" speakers
4 channel mode	not used	not used
6 channel mode	Connect to F/DAP out	Connect to the amplifier for "F/DAP"

Attention

i) When the digital signal is selected as an input signal, the output signal to MAIN OUT of LINE is still an analog input from IN terminal of LINE.

ii) When you select analog source by "main" amplifier, be sure to turn the DIGITAL DIRECT switch ❸ off.

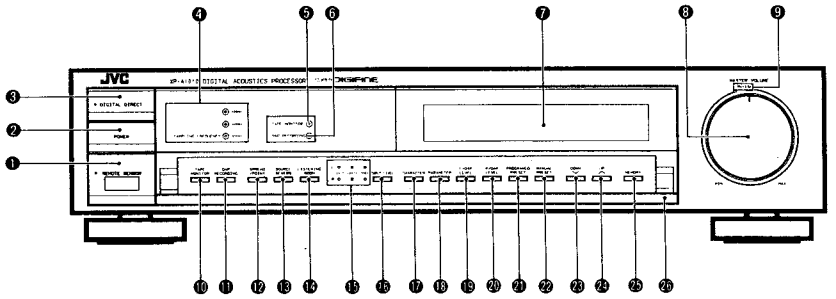
iii) When connecting DAT via coaxial cable, please connect the analog REC/PLAY cable to "TAPE" terminal of XP-A1010TN at the same time.

* Among JVC digital amplifier, there are some models which have time delay between digital signal in and speaker out. When you use this type of amplifier, please consult your JVC dealer.

Moreover, there is some types of JVC amplifier on which the main signal is not output when the DAT MONITOR switch and the TAPE MONITOR switch are turned on at the same time. In such a case, please turn off the TAPE MONITOR switch and control main level by the volume on the amplfier. The main level cannot be controlled by the master volume on XP-A1010TN.

DESCRIPTION AND FUNCTIONS

Front Panel



❶ REMOTE SENSOR
Receives signals from the remote control unit. The indicator is lit while receiving a signal.

❷ POWER
Push this button to turn the power on. Push it again to turn the power off.

❸ DIGITAL DIRECT
Changes input to digital or analog. When digital input is specified, this indicator is lit.

❹ SAMPLING FREQUENCY Indicator
Indicates sampling frequency of digital input; indicates the 48 kHz sampling frequency of DAP during analog input.

❺ TAPE MONITOR Indicator
TAPE MONITOR indicator is lit during operation.

❻ DAP RECORDING Indicator
DAP RECORDING indicator is lit during operation.

❼ Multi-mode display
Displays the operation modes.

❽ MASTER VOLUME
Adjusts volume of the main output, and the front and rear DAP output.

❾ MUTE Indicator
This indicator is lit while MASTER VOLUME is muted. It flickers while main output, and front or rear DAP output are muted.

❿ TAPE MONITOR
When this switch is pushed, TAPE MONITOR indicator ❺ is lit to change the LINE IN input to tape input or to DAT input. Push it again to set the LINE IN input.

⓫ DAP RECORDING
Mixes front DAP output with main output, and outputs the mixed signal to TAPE REC terminal. DAP RECORDING indicator ❻ is lit during operation.

⓬ SPREAD/POINT
Select SPREAD or POINT to match the source. By first press the present condition is displayed, and next press changes this parameter.
SPREAD: Select for playback of a large organized group, such as an orchestra.
POINT: Select for playback of a small group, such as a piano solo.

⓭ SOURCE REVERB
Push this button to set the source reverb time using the DOWN ∨ ㉘ and UP ∧ ㉙ buttons. Use this button when the source contains a substantial reverb components.

⓮ LISTENING ROOM
Each time this button is pushed, : first, L. ROOM REVERB, then L. ROOM SIZE are displayed and, finally, the previous display is shown.
L. ROOM REVERB: Set the degree of sound reverberation time of the listening room using the DOWN ∨ ㉘ and UP ∧ ㉙ buttons.
L. ROOM SIZE: Set the listening room size using the DOWN ∨ ㉘ and UP ∧ ㉙ buttons.

⓯ INPUT LEVEL Indicator
Indicates the level of the analog signal input to the DAP. When the 15 bit indicator sometimes lights, the DAP operating characteristics are the best. Push INPUT LEVEL button ⓰ to adjust the input level to 15 Bit by using the DOWN ∨ ㉘ and UP ∧ ㉙ buttons.

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⑯ INPUT LEVEL
Push this button to adjust the level and balance of the analog signal input to the DAP: first, INPUT LEVEL, then INPUT BALANCE are displayed and, finally, the previous display is shown. Each time this button is pushed, the program parameters are sequentially displayed.

INPUT LEVEL: Push the DOWN ∨ button ㉓ to reduce the signal level. Push the UP ∧ button ㉒ to increase it.

INPUT BALANCE: Push the DOWN ∨ button ㉓ to shift the input balance (between the left and right channels) to the L-channel. Push the UP ∧ button ㉒ to shift the input balance to the R-channel. (See page 21 for further detail.)

⑰ CHARACTER
Push this button to specify a title for each sound-field data program created in manual preset mode by using the DOWN ∨ ㉓ and UP ∧ ㉒ buttons. The title can be displayed on the multi-mode display.

⑱ PARAMETER
Each time this button is pushed, the parameters corresponding to a program are sequentially displayed, and finally, the previous display is shown. (Refer to P.28)

ROOM SIZE: Push the DOWN ∨ ㉓ or UP ∧ ㉒ button to set the desired sound-field size (e.g., hall, jazz club).

LIVENESS: Push the DOWN ∨ ㉓ or UP ∧ ㉒ button to set the reflecting sound level and damping characteristics of the desired sound-field.

LPF: Push the DOWN ∨ ㉓ or UP ∧ ㉒ button to set the frequency characterisitcs of the reflecting sound and reverberating sound.

REVERB LEVEL: Push the DOWN ∨ ㉓ or UP ∧ ㉒ button to set the reverberation sound level.

HF REVERB: Push the DOWN ∨ ㉓ or UP ∧ ㉒ button to set the reverberation time at high frequency to middle frequency.

REAR DELAY: Push the DOWN ∨ ㉓ or UP ∧ ㉒ button to set the delay time of the R/DAP playback signals. (Preset number 16-20 only)

OFFS DELAY: Use this parameter to conpensate time delay using the DOWN ∨ ㉓ and UP ∧ ㉒ button when the amplifier with D/A converter which is connected to the digital THRU OUT terminal has time delay between digital signal in and speaker out.

⑲ F/DAP LEVEL
Push this button to adjust the front DAP output signal level by using the DOWN ∨ ㉓ and UP ∧ ㉒ buttons.

⑳ R/DAP LEVEL
Push this button to adjust the rear DAP output signal level by using the DOWN ∨ ㉓ and UP ∧ ㉒ buttons.

㉑ PROGRAMED PRESET
Push this button to load any of the 20 types of preprogrammed sound-field data by using the DOWN ∨ ㉓ and UP ∧ ㉒ buttons. The data are not to be lost.

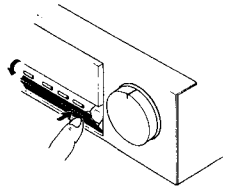
㉒ MANUAL PRESET
Push this button to load any of the 20 manually created and memorized sound-field data programs by using the DOWN ∨ ㉓ and UP ∧ ㉒ buttons to scan the list. The user can change the same 20-types of sound-field data, saved when shipped from the factory, as are loaded by pushing the button PROGRAMED PRESET ㉑.

㉓ DOWN ∨
Use this button for level adjustment, balance adjustment, timing adjustment, character setting and memory loading.

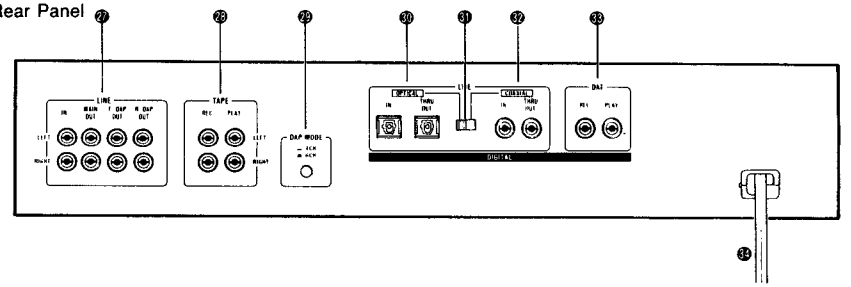
㉔ UP ∧
Use this button for level adjustment, balance adjustment, timing adjustment, character setting and memory loading.

㉕ MEMORY
Push this button to save sound-field data and characters in MANUAL PRESET mode.

㉖ Control Panel Cover
Push the indicator "PUSH OPEN" to open the control panel cover. Push the cover again to close it.



Rear Panel



㉗ LINE (Analog)
IN: Connect the output from the source.
MAIN OUT: Connect the main amplifier (analog input).
F/DAP OUT: Connect the front sound field amplifier (analog input).
R/DAP OUT: Connect the rear sound field amplifier (analog input).

㉘ TAPE: Connect the analog tape deck.

㉙ DAP MODE: Changes mode to 4-channel DAP or 6-channel DAP.

㉚ LINE (Digital)
OPTICAL
IN: Connect the optical digital-signal output from the source. Use the supplied optical fiber cable.
THRU OUT: Outputs the input to the IN terminal. Connect the optical digital input terminal of the main amplifier.

㉛ OPTICAL/COAXIAL Selection switch: Changes the digital signal input to match the connected optical cable or coaxial cable.

㉜ LINE (Digital)
COAXIAL
IN: Connect the coaxial digital-signal output from the source.
THRU OUT: Outputs the input to the IN terminal. Connect the digital coaxial input terminal of the main amplifier.

㉝ DAT: Connect the DAT deck (digital input/output terminal).

㉞ Power Cord

REMOTE CONTROL UNIT (RM-SXA1010U)

BEFORE USE

- How to install the batteries

1. Slide the cover of the battery case in the direction of the arrow to remove it.
2. Install the provided batteries ("AAA": UM-4, R03, 1.5 V), with their polarities properly placed.
3. Re-install the cover of the battery case.

- **Battery replacement time**

When the distance at which the remote control unit functions begins to decrease, replace both batteries ("AAA": UM-4, R03, 1.5 V).

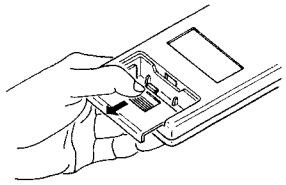
- **Batteries**

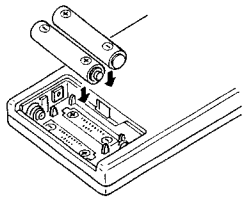
Incorrect use of batteries can cause corrosion or damage. Note the following points to lengthen battery life.

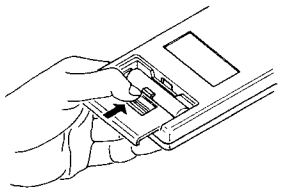
1. Install batteries observing the correct polarity, (+) and (−).
2. Do not use new and old batteries simultaneously.
3. Batteries with similar shapes may have different voltage ratings, be sure to use the correct batteries.
4. Remove batteries from the remote control unit if it will not be used for a long period of time.

Note:

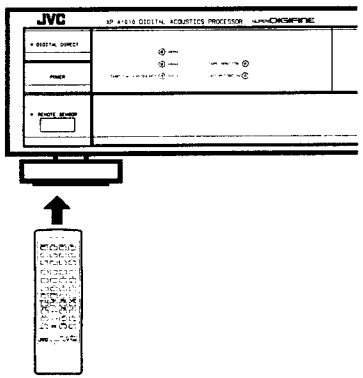
- **The lower the temperature, the shorter the battery life.**



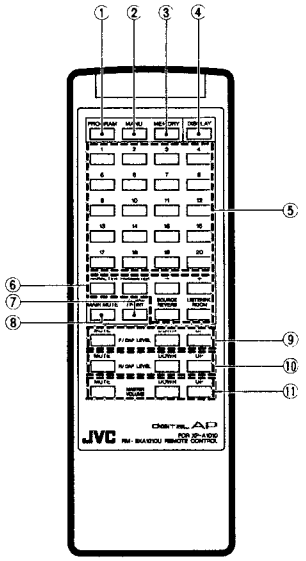




How to operate the remote control unit



When the remote control unit is directly in line with the remote sensor of this unit, the remote control unit may be used from as far away as 7 meters (23 feet). But, when it is being used from a position one side or the other, this distance will be shortened.



① **PROGRAM**
Push this button to load any of the 20 types of preprogrammed sound-field data by using Memory Preset Number, button ⑤.

② **MANU**
Push this button to load any of the 20 types of manually created sound-field data by using Memory Preset Number, button ⑤.

③ **MEMORY**
Push this button to save any of the 20 types of manually created sound-field data by using Memory Preset Number, button ⑤.

④ **DISPLAY:**
Push this button to turn on and off the following indicators:

Input level indicator ⑮ is turned off.
↓
Input level indicator ⑮ and multi-mode display ⑦ are turned off.
↓
Input level indicator ⑮ and multi-mode display ⑦ are turned on.

⑤ **MEMORY Preset Number**
Push the Memory Preset Number, buttons 1 to 20, to load sound-field data in program preset mode or manual preset mode. This button specifies the preset number to save the sound-field data created in manual preset mode.

⑥ **CHARACTER**
Push this button to name a title for each sound-field data program created in manual preset mode. Each pressing moves the cursor and changes the character using the "−" button ⑥ and "+" button ⑥. The title can be displayed on the multi-mode display.

⑥ **PARAMETER**
Each time this button is pushed, the parameters corresponding to a program are sequentially displayed. (Refer to P.28)

ROOM SIZE: Push the "−" button ⑥ or "+" button ⑥ to set the desired sound-field size (e.g., hall, jazz club).

LIVENESS: Push the "−" button ⑥ or "+" button ⑥ to set the reflecting sound level and damping characteristics of the desired sound-field.

LPF: Push the "−" button ⑥ or "+" button ⑥ to set the frequency characterisitcs of the reflecting sound and reverberating sound.

REVERB LEVEL: Push the "−" button ⑥ or "+" button ⑥ to set the reverberation sound level.

HF REVERB: Push the "−" button ⑥ or "+" button ⑥ to set the reverberation time at high frequency to middle frequency.

REAR DELAY: Push the "−" button ⑥ or "+" button ⑥ to set the delay time of the R/DAP playback signals. (Preset number 16-20 only)

OFFS DELAY: Use this parameter to conpensate time delay using the "−" button ⑥ and "+" button ⑥ when the amplifier with D/A converter which is connected to the digital THRU OUT terminal has time delay between digital signal in and speaker out.

⑥ **SOURCE REVERB**
Push this button to set the source reverb time using the "−" button ⑥ and "+" button ⑥. Use this button when the source contains a substantial reverb components.

⑥ **LISTENING ROOM**
Each time this button is pushed, : first, L. ROOM REVERB, then L ROOM SIZE are displayed and, finally, the previous display is shown.

L. ROOM REVERB:
Set the degree of sound reverberation in the listening room using the "−" button ⑥ and "+" button ⑥.

L. ROOM SIZE:
Set the listening room size using the "−" button ⑥ and "+" button ⑥.

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⑥ − Use this button for level adjustment, balance adjustment, timing adjustment, character setting, sound-field data creation and memory loading. Select adjustment in "−" direction and specify characters in reverse order.

⑥ + Use this button for level adjustment, balance adjustment, timing adjustment, character setting, sound-field data creation and memory loading. Select adjustment in "+" direction and specify characters in forward order.

⑦ **SPREAD/POINT**
Select SPREAD or POINT to match the source. By first press the present condition is displayed, and next press changes this parameter.
SPREAD: Select for playback of a large organized group, such as an orchestra.
POINT: Select for playback of a small group, such as a piano solo.

⑧ **MAIN MUTE**
Push this button to mute the main system signals. The Mute indicator flickers while this mode is activated. Push it again to cancel muting.

⑨ **F/DAP LEVEL**
MUTE: Push this button to mute the front DAP output signal level. The Mute indicator flickers. Push it again to cancel muting.
DOWN: Each time this button is pushed, the front DAP output signal level is reduced. Keep pushing it to continuously reduce the level.
UP: Each time this button is pushed, the front DAP output signal level is increased. Keep pushing it to continuously increase the level.

⑩ **R/DAP LEVEL**
MUTE: Push this button to mute the rear DAP output signal level. The Mute indicator flickers while this mode is activated. Push it again to cancel muting.
DOWN: Each time this button is pushed, the rear DAP output signal level is reduced. Keep pushing it to continuously reduce the level.
UP: Each time this button is pushed, the rear DAP output signal level is increased. Keep pushing it to continuously increase the level

⑪ **MASTER VOLUME**
MUTE: Push this button to mute the total volume of the main, front DAP and rear DAP output. The mute indicator on the main set is lit. Push it again to release muting.
DOWN: Pressing this button rotates the Master Volume Knob CCW to reduce the total level.
UP: Pressing this button rotates the Master Volume Knob CW to increase the total level

OPERATION

- Refer to the relevant instruction manuals for the operation of the amplifiers.
- Adjust the volume levels of the amplifiers to the same setting.
- Turn down MASTER VOLUME ⑧
- Confirm "Connection and Preparations" prior to turning on the power to the devices.

How to use PROGRAMED PRESET

The DAP has 20 sound-field programs containing sound-field data of famous concert halls, churches, etc. Select a favorite sound-field pattern.

1. Playback the source.

2. Setting source and listening room parameters

[SPREAD/POINT] • Push the SPREAD/POINT button ⑫ or ⑦ to specify SPREAD or POINT according to the music selected for playback.
SPREAD : Specified for a large performance such as an orchestra.
POINT : Specified for a small performance such as a piano solo.

[SOURCE REVERB] : Specify the optimum reverberation time according to the source's reverberation time.

1. Push the SOURCE REVERB button ⑬ or ⑥ to show the reverberation time on the display.

```
P 1:Symphony Hall 1
SOURCE REVERB = 0.0s
```

[display]

2. Push the "−" or "+" button ⑥ on the remote control unit, (the DOWN ∨ ㉓ or UP ∧ ㉒ button on the main set), to set the source reverberation time.

Time setting guideline (second)

Church music	3 ~ 4
Performance in a large-size hall	1 ~ 2
Performance in a small-size hall	0.5 ~ 1
Live house	0.3 ~ 0.5

[LISTENING ROOM]

1. Push the LISTENING ROOM button ⑭ to show "L.ROOM REVERB" on the display.

```
P 1:Symphony Hall 1
L.ROOM REVERB = 0.4s
```

[display]

2. Push the [−] or [+] button ⑥ on the remote control unit, (the DOWN ∨ ㉓ or UP ∧ ㉒ button on the main set), to set the reverberation time of the listening room.

You can find the approximate reverberation time of your listening room by clapping hands.

L. ROOM REVERB	Reverb time of hand clapping
0.6 seconds	Longer
0.4 seconds	Middle
0.2 seconds	Shorter

3. Push the LISTENING ROOM button ⑭ to show "L.ROOM SIZE" on the display.

```
P 1:Symphony Hall 1
L.ROOM SIZE =10~16m²
```

[display]

4. Push the "−" or "+" button ⑥ on the remote control unit, (the DOWN ∨ ㉓ or UP ∧ ㉒ button on the main set), to set the listening room size.

~ 10 m²
10 ~ 16 m²
16 m² ~

Note:
Once these parameters are set, they are fixed until other values are newly set.

3. Load the program.

[On the remote control unit]

1.

Push the PROGRAM button ①.

2.

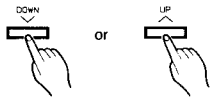
Push the Memory Preset Number button ⑤ to specify the program.

[On the main set]

1.

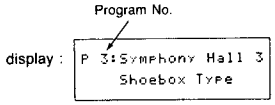
Push the PROGRAMED PRESET button ㉒

2.

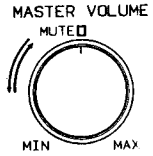


Push the DOWN ∨ ㉓ or UP ∧ ㉑ buttons to specify the program.

Program name and type name are shown on the display.



4. Adjust the volume.



Adjust the volume using MASTER VOLUME (⑧ or ⑪).

Music is playedback with surrounding sound field effects.
Use the 'Adjustment' procedure to adjust the volume.
(Refer to P.21)

PROGRAM CHARACTERISTICS

20 programs are provided for sound-field reproduction based on the sound-field data of famous musical performance facilities all over the world. Select the programmed sound-field according to the music source that you want reproduced for playback.

P1: Symphony Hall 1 Shoebox Type
Reproduces the sound field of a Dutch shoe-box type hall, built in 1888, with about 2200 seats. This is an arena type hall with a comparatively short depth and greater width. It is famous for its good sound effects.

P2: Symphony Hall 2 Shoebox Type
Reproduces the sound field of a West German shoe-box type hall, rebuilt in 1981, accommodating about 2500 persons. This hall provides shorter reverberation timing than the newer halls, strong reflected sound in the direction of the stage and powerful sound where direct sound is amplified.

P3: Symphony Hall 3 Shoebox Type
Reproduces the sound field of a Japanese hall, built in 1983, accommodating about 1000 persons. This hall is a typical shoe-box type with a flat ceiling.

P4: Symphony Hall 4 Vineyard Type
Reproduces the sound field of a modern hall, opened in West Germany in 1985, having 2500 seats. This hall has a mostly wooden interior and complicated reflecting plates to diffuse reflected sound.

P5: Symphony Hall 5 Vineyard Type
Reproduces the sound field of a Japanese hall for classical music, completed in 1986, having about 2000 seats. 10 transparent reflecting plates are installed in the upper section of the stage.

P6: Symphony Hall 6 Vineyard Type
Reproduces the sound field of a multi-purpose concert hall, constructed in West Germany in 1959, accommodating about 1500 persons. The ceiling has a complicated structure for sound diffusion. The reverberation characteristics are comparatively dead.

P7: Recital Hall Small Musical Space
Reproduces the sound field of a hall used for classical music recitals. This hall with an elliptic shape is located in Holland and produces an at-home atmosphere.

P8: Opera House with Tiered Seating
Reproduces the sound field of an opera house where the seats are tiered. This opera house with a high ceiling and short depth is located in Austria.

P9: Cathedral Gothic Style
Reproduces the sound field of a church built in the Middle Ages. This huge West German cathedral is made of stone; it has a ceiling height of 40m.

P10: Church High-ceilinged Space
Reproduces the sound field of a church with a high ceiling. This program is suitable for playback of pipe organ music and church music. This church in West Germany is middle-sized among European churches and has natural reverberation characteristics.

P11: Live Club 1 Jazz Club
Reproduces the sound field of a jazz club. It is a live house with a low ceiling and an intimate atmosphere where musicians plays very near the audience.

P12: Live Club 2 Discotheque
Reproduces the sound field of a discoteque.

P13: Pavilion Live Concert
Reproduces the sound field of an octagonal pavilion with a high ceiling.

P14: Gymnasium Hard-floored Hall
Reproduces the sound field of a board-floor gymnasium which generates much reflected sound.

P15: Stadium Outdoor Live Concert
Reproduces the sound field for a music performance in a baseball or football stadium with about 30,000 seats.

P16: Movie Theater 1 Small Space
Reproduces the sound field of a movie theater, of rectangular shape, with about 100 seats.
(R/DAP OUT outputs the delayed L—R signals.)

P17: Movie Theater 2 Medium-sized Space
Reproduces the sound field of a movie theater with 400 to 500 seats.
(R/DAP QUT outputs the delayed L—R signals.)

P18: Movie Theater 3 Large Space
Reproduces the sound field of a movie theater with about 1,000 seats.
(R/DAP OUT outputs the delayed L—R signals.)

P19: Movie Theater 4 Extra Large Space
Reproduces the sound field of a movie theater with about 1,500 seats.
(R/DAP OUT outputs the delayed L—R signals.)

P20: Movie Theater 5 Standard
Outputs no signals to F/DAP OUT.
(R/DAP OUT outputs the delayed L—R signals.)

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ADJUSTMENT

1. Operating Level Adjustment

For optimum operation, adjust the analog input signal level.

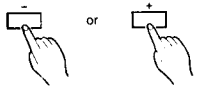
1.1 Connect the source equipment to LINE IN and play some music which is recorded in relatively high level.

1.2 INPUT LEVEL Display

Push the INPUT LEVEL button ⑮ to show the input level on the display.

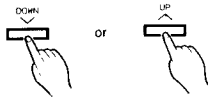
[display]

1.3 Level Adjustment
[On the remote control unit]



Push the "–" or "+" button ⑥ to light the "15 bit" at times in the Input Level indicator ⑬

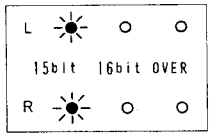
[On the main set]



Push the DOWN ∨ ㉓ or UP ∧ ㉔ button to light the "15 bit" at times in the Input Level indicator ⑬

Each time the button is pushed, the level is reduced or increased. Keep pushing it to continuously change the level.

INPUT LEVEL Indicator



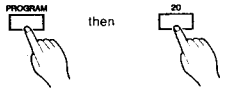
2. INPUT Balance Adjustment

When you select either mode of program 16 — 20 (MOVIE THEATER), adjust the right-left balance of the input signal. Refer to the following procedure.

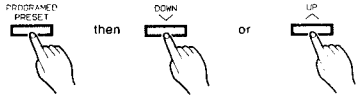
2.1 Input "monaural" signal

Connect the "monaural" signal to LINE IN terminals.

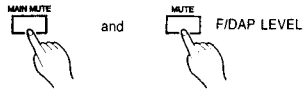
2.2 Program Number specification (ex. Program Number 20)
[On the remote control unit]



[On the main set]



2.3 Output R/DAP signals only



Push the MAIN MUTE button ⑧ and F/DAP MUTE button ⑨ to mute the main and F/DAP signals and output only the R/DAP signals.

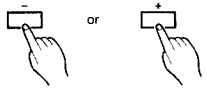
2.4 INPUT BALANCE display

Push the INPUT LEVEL button ⑮ twice to show the input balance on the display.

display :

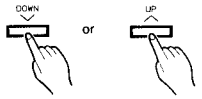
2.5 Balance adjustment (INPUT BALANCE display)

[On the remote control unit]



Push the "–" or "+" button ⑥ to set the R/DAP level to a minimum.

[On the main set]



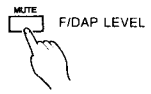
Push the DOWN ∨ ㉓ or UP ∧ ㉔ button to set the R/DAP level to a minimum.

Each time the button is pushed, the balance is varied by one increment. Keep pushing it to continuously change the balance.

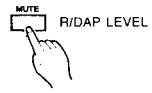
3. F/DAP-R/DAP balance adjustment

No level adjustment is required if the amplifiers and speakers have the similar specification.

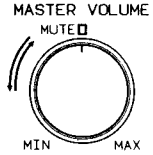
3.1 Mute the sound-field signal.



Push the F/DAP MUTE button ⑨ and R/DAP MUTE button ⑩ to mute the sound of the sound-field signal.

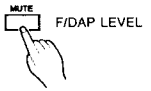


3.2 Set the MASTER VOLUME



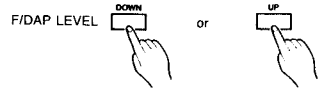
Rotate the MASTER VOLUME knob ⑧ to set the normal level of the main signal.

3.3 Release muting

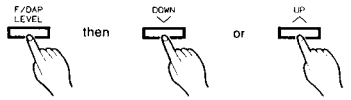


Push the F/DAP MUTE button ⑨ again to release muting.

3.4 F/DAP adjustment
Adjust the F/DAP level to be balanced with the main signal.
[On the remote control unit]



[On the main set]



Each time the button is pushed, the level is reduced or increased. Keep pushing it to continuously change the level.

3.5 F/DAP-R/DAP balance

3.5.a

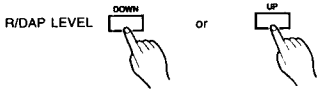
Push the MAIN MUTE button ⑧ to mute the main signal.

3.5.b

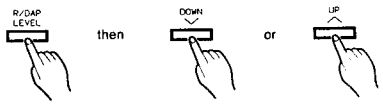
Push the R/DAP MUTE button ⑩ again to release muting.

3.5.c Adjust the R/DAP level to be balanced with the F/DAP level.

[On the remote control unit]



[On the main set]



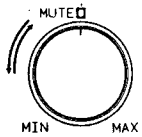
Each time the button is pushed, the level is reduced or increased. Keep pushing it to continuously change the level.

3.6 Release muting

Push the MAIN MUTE button ⑧ to release muting.

3.7 Adjust the total level

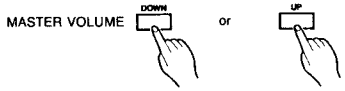
[On the main set]



Rotate the MASTER VOLUME ⓯ to adjust the total level.

or

[On the remote control unit]



PARAMETER CHANGE

The programs contain the various data for sound-field reproduction based on the data collected in the performance places using the symmetrical 6-point sound-field analyzing method. You can create your own original sound-field reproduction pattern by changing the parameters and then saving the new sound-field pattern in a manual-memory location.

1. Selecting a program

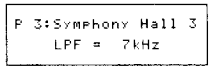
Select a program according to the "How To use PROGRAMED PRESET". (P. 18)(ex. program 3)

2. Selecting parameters

[On the remote control unit] [On the main set]

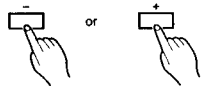
LPF: 7 kHz

Push the PARAMETER buttons ⓭ or ⑥ to select the parameters to be changed.



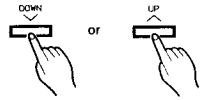
3. Changing parameters

[On the remote control unit]

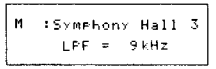


Push the "–" or "+" button ⑥ to set the parameter's value.

[On the main set]



Push the DOWN ∨ ⓬ or UP ∧ ⓫ button to set the parameter's value.



Each time the button is pushed, the value is reduced or increased by one unit. Keep pushing it to continuously change the value.

4. Change each parameter by repeating Steps 2 and 3

- See P.6 for definitions of the parameter values.
- Changed parameters return to the programed value when another program is loaded if it is not stored in manual memory.
  Using the manual memory procedure, store the changed parameters in manual memory to save your new original sound- field program.

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MANUAL MEMORY — Saving in Manual Preset

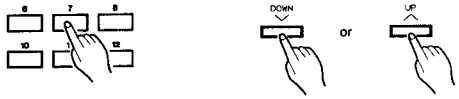
You can save a maximum of 20 of your own sound-field programs.

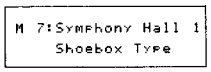
1. Select and change the parameters using the procedures described above.
2. Push the MEMORY buttons ③ or ㉕, and the MEMORY No. position mark on the main set blinks.

[On the remote control unit] [On the main set]

3. Specify the memory channel number.

[On the remote control unit] [On the main set]





Keep pushing the button to continuously change the channel No. When the desired channel is displayed, release the button.

Your own sound-field program has been saved in the specified manual preset memory.

CHARACTERS

Titles and messages can be saved for programs created in manual mode.

Procedure: Change the title of program number 3 into "JVC" and save it in manual preset number 7.

1. Load a manually-created program.

[On the remote control unit]

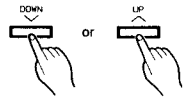
1. Push the MANUAL button ②.

2. Push the Program No. button ⑤.

[On the main set]

1. Push the MANUAL PRESET button ㉒.

2. Push the DOWN ∨ ㉘ or UP ∧ ㉗ button to specify the program No.



Display :

2. Specify a character position using the cursor.

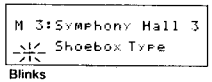
1. [On the remote control unit]

Push the CHARACTER button ⑥ to display the cursor.

[On the main set]

Push the CHARACTER button ⑰ to display the cursor.

display :



Blinks

2. [On the remote control unit]

Push the CHARACTER button ⑥ again to move the cursor to the character position. Each time the button is pushed, the cursor moves one position to the right. Keep pushing it to continuously move the cursor.

[On the main set]

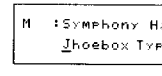
Push the CHARACTER button ⑰ again to move the cursor to the character position.

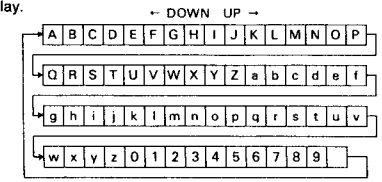
3. Specify a character

[On the remote control unit] Push the – or + button to specify a character.

[On the main set] Push the DOWN ∨ ㉘ or UP ∧ ㉗ button to specify a character.

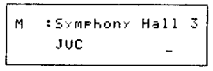
Each time the button is pushed, the characters and numbers shown below are displayed. Keep pushing it to continuously change the display.



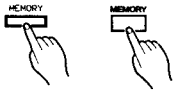


4. Create a title or message by repeating Step 2 and 3

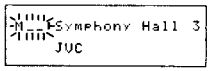
- Delete unnecessary parts using "(space)"



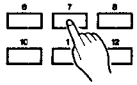
5. Save the title or message.



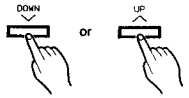
Push the MEMORY button ③ or ⑮ to save the character.



6. Specify the memory channel No.
[On the remote control unit]



[On the main set]



Keep pushing the button to continuously change the channel number.
When the desired channel is displayed, release the button.

Your title or message has been saved in the specified manual preset memory.

ACOUSTICS PROCESSING MODE PATTERNS

ACOUSTICS PROCESSING MODE PATTERNS

NO	PROGRAM NAME	TYPE	PARAMETER NAME	LOW-	PRESET VALUE	-HIGH
1	SYMPHONY HALL 1	SHOEBOX TYPE	ROOM SIZE	0.5	1	2
			LIVENESS	0.5	1	2
			LPF	1 kHz	7 kHz	16 kHz, THRU
			REVERB LEVEL	0	1	2
			HF REVERB	0.1	0.7	1
2	SYMPHONY HALL 2	SHOEBOX TYPE	ROOM SIZE	0.5	1	2
			LIVENESS	0.5	1	2
			LPF	1 kHz	7 kHz	16 kHz, THRU
			REVERB LEVEL	0	1	2
			HF REVERB	0.1	0.7	1
3	SYMPHONY HALL 3	SHOEBOX TYPE	ROOM SIZE	0.5	1	2
			LIVENESS	0.5	1	2
			LPF	1 kHz	7 kHz	16 kHz, THRU
			REVERB LEVEL	0	1	2
			HF REVERB	0.1	0.7	1
4	SYMPHONY HALL 4	VINEYARD TYPE	ROOM SIZE	0.5	1	2
			LIVENESS	0.5	1	2
			LPF	1 kHz	7 kHz	16 kHz, THRU
			REVERB LEVEL	0	1	2
			HF REVERB	0.1	0.7	1
5	SYMPHONY HALL 5	VINEYARD TYPE	ROOM SIZE	0.5	1	2
			LIVENESS	0.5	1	2
			LPF	1 kHz	7 kHz	16 kHz, THRU
			REVERB LEVEL	0	1	2
			HF REVERB	0.1	0.7	1
6	SYMPHONY HALL 6	VINEYARD TYPE	ROOM SIZE	0.5	1	2
			LIVENESS	0.5	1	2
			LPF	1 kHz	7 kHz	16 kHz, THRU
			REVERB LEVEL	0	1	2
			HF REVERB	0.1	0.7	1
7	RECITAL HALL	SMALL MUSICAL SPACE	ROOM SIZE	0.5	1	2
			LIVENESS	0.5	1	2
			LPF	1 kHz	8 kHz	16 kHz, THRU
			REVERB LEVEL	0	1	2
			HF REVERB	0.1	0.8	1
8	OPERA HOUSE	WITH TIERED SEATING	ROOM SIZE	0.5	1	2
			LIVENESS	0.5	1	2
			LPF	1 kHz	8 kHz	16 kHz, THRU
			REVERB LEVEL	0	1	2
			HF REVERB	0.1	0.8	1
9	CATHE-DRAL	GOTHIC STYLE	ROOM SIZE	0.5	1	2
			LIVENESS	0.5	1	2
			LPF	1 kHz	5 kHz	16 kHz, THRU
			REVERB LEVEL	0	1	2
			HF REVERB	0.1	0.5	1
10	CHURCH	HIGH-CEILINGED SPACE	ROOM SIZE	0.5	1	2
			LIVENESS	0.5	1	2
			LPF	1 kHz	6 kHz	16 kHz, THRU
			REVERB LEVEL	0	1	2
			HF REVERB	0.1	0.6	1
11	LIVE CLUB 1	JAZZ CLUB	ROOM SIZE	0.5	1	2
			LIVENESS	0.5	1	2
			LPF	1 kHz	16 kHz	THRU
			REVERB LEVEL	0	1	2
			HF REVERB	0.1	1	—
12	LIVE CLUB 2	DISCO-THEQUE	ROOM SIZE	0.5	1	2
			LIVENESS	0.5	1	2
			LPF	1 kHz	16 kHz	THRU
			REVERB LEVEL	0	1	2
			HF REVERB	0.1	1	—
13	PAVILION	LIVE CONCERT	ROOM SIZE	0.5	1	2
			LIVENESS	0.5	1	2
			LPF	1 kHz	6 kHz	16 kHz, THRU
			REVERB LEVEL	0	1	2
			HF REVERB	0.1	0.6	1
14	GYMNA-SIUM	HARD-FLOORED HALL	ROOM SIZE	0.5	1	2
			LIVENESS	0.5	1	2
			LPF	1 kHz	8 kHz	16 kHz, THRU
			REVERB LEVEL	0	1	2
			HF REVERB	0.1	0.8	1
15	STADIUM	OUTDOOR LIVE CONCERT	ROOM SIZE	0.5	1	2
			LIVENESS	0.5	1	2
			LPF	1 kHz	3 kHz	16 kHz, THRU
			REVERB LEVEL	0	1	2
			HF REVERB	0.1	0.3	1
16	MOVIE THEATER 1	SMALL SPACE	ROOM SIZE	0.5	1	2
			LIVENESS	0.5	1	2
			LPF	1 kHz	16 kHz	THRU
			REVERB LEVEL	0	1	2
			HF REVERB	0.1	1	—
			REAR DELAY	15 ms	20 ms	30 ms
17	MOVIE THEATER 2	MEDIUM-SIZED SPACE	ROOM SIZE	0.5	1	2
			LIVENESS	0.5	1	2
			LPF	1 kHz	8 kHz	16 kHz, THRU
			REVERB LEVEL	0	1	2
			HF REVERB	0.1	0.8	1
			REAR DELAY	15 ms	20 ms	30 ms
18	MOVIE THEATER 3	LARGE SPACE	ROOM SIZE	0.5	1	2
			LIVENESS	0.5	1	2
			LPF	1 kHz	7 kHz	16 kHz, THRU
			REVERB LEVEL	0	1	2
			HF REVERB	0.1	0.7	1
			REAR DELAY	15 ms	20 ms	30 ms
19	MOVIE THEATER 4	EXTRA LARGE SPACE	ROOM SIZE	0.5	1	2
			LIVENESS	0.5	1	2
			LPF	1 kHz	8 kHz	16 kHz, THRU
			REVERB LEVEL	0	1	2
			HF REVERB	0.1	0.8	1
			REAR DELAY	15 ms	20 ms	30 ms
20	MOVIE THEATER 5	STANDARD	REAR DELAY	15 ms	20 ms	30 ms

NOTE: Each mode pattern (except preset No. 20) has a parameter of Offset Delay (OFFS DELAY). See page 6 for use.

TABLE OF PARAMETERS

	PARAMETER	ADJUSTABLE RANGE	STEP	INITIAL VALUE	REMARKS
1	ROOM SIZE	0.5 — 2	0.1	1	Can be stored in Manual Preset Memory
2	LIVENESS	0.5 — 2	0.1	1	
3	LOW PASS FILTER	1 — 16 kHz, THRU	1 kHz		
4	REVERB LEVEL	0 — 2	0.1	1	
5	HIGH-FREQ. REVERB	0.1 — 1	0.1		
6	OFFSET DELAY	0 — 200 ms	1 ms	0 ms	
7	REAR DELAY	15 — 30 ms	1 ms	20 ms	
8	SPREAD/POINT	SPREAD/POINT		SPREAD	Last setting held in Memory
9	LISTENING ROOM REVERB	0.2 — 0.6 ms	0.1 ms	0.4 ms	
10	LISTENING ROOM SIZE	10 m^2 or less, 10 — 16 m^2, 16 m^2 or more		10 —, 16 m^2	
11	SOURCE REVERB	0 — 5 sec	0.1 sec	0 sec	

TERMINAL OUTPUT AND RECORDING

Terminal output signals are changed by switch settings.
Music can be recorded after connecting a cassette deck and DAT deck to the TAPE terminal and DAT terminal, respectively.

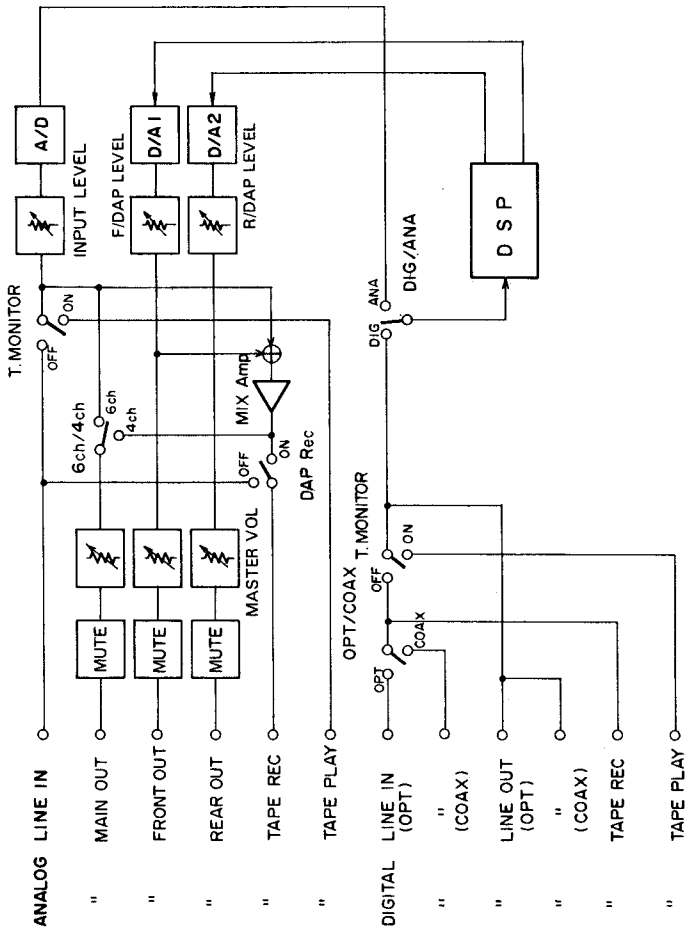
Notes:

* F/DAP is mixed with source sound during recording in this mode.
Adjust the recording level on the deck. For details on the tape deck operation, refer to the tape deck instruction manual.

** Do not use this switch-combination mode, because analog and digital signals are mixed and output to the MAIN OUT terminal.

Switch Operation				TAPE REC	DAT REC	MAIN
❸ DIGITAL DIRECT	❶ DAP REC	❷ DAP MODE	❿ TAPE MONITOR	Output Signal (Analog)	Output Signal (Digital)	Output Signal (Analog)
OFF	ON	4 Channel	ON			
			OFF	* Analog LINE IN + F/DAP	Digital LINE IN	Analog LINE IN + F/DAP
		6 Channel	ON			
			OFF	* Analog LINE IN + F/DAP	Digital LINE IN	Analog LINE IN
	OFF	4 Channel	ON	Analog LINE IN	Digital LINE IN	TAPE PLAY + F/DAP
			OFF	Analog LINE IN	Digital LINE IN	Analog LINE IN + F/DAP
		6 Channel	ON	Analog LINE IN	Digital LINE IN	TAPE PLAY
			OFF	Analog LINE IN	Digital LINE IN	Analog LINE IN
ON	ON	4 Channel	ON			
			OFF			
		6 Channel	ON			
			OFF			
	OFF	4 Channel	ON	Analog LINE IN	Digital LINE IN	** TAPE PLAY + DAT PLAY F/DAP
			OFF	Analog LINE IN	Digital LINE IN	** Analog LINE IN + Digital LINE IN F/DAP
		6 Channel	ON	Analog LINE IN	Digital LINE IN	TAPE PLAY
			OFF	Analog LINE IN	Digital LINE IN	Analog LINE IN

BLOCK DIAGRAM



TROUBLESHOOTING

Symptom	Possible Causes	Remedy
• No power although power switch is turned on.	• Power cord is disconnected.	• Connect the power cord.
• No sound from the main speakers.	• MAIN MUTE button ⑧ of the remote controller is pushed, and MUTE indicator ❾ is flickering.	• Push the MAIN MUTE button ⑧ to cancel muting.
• No sound from either front or rear DAP speakers.	• DIGITAL DIRECT switch ❸ is not turned on although a digital amplifier is connected. • DIGITAL DIRECT switch ❸ is turned on although an analog amplifier is connected.	• Push the DIGITAL DIRECT switch to turn the indicator light on. • Push the DIGITAL DIRECT switch again to turn the indicator light off.
• No sound from any speakers.	• MASTER VOLUME MUTE button ⑪ of the remote controller is pushed, and the MUTE indicator ❾ is lit. • The volume of each connected amplifier is lowered.	• Push the MUTE button ⑪ to cancel muting. • Turn the volume up.
• No sound from front DAP speakers.	• F/DAP LEVEL MUTE button ⑨ of the remote controller is pushed, and the MUTE indicator ❾ is flickering. • The volume of each connected amplifier is lowered.	• Push the MUTE button ⑨ to cancel muting. • Turn the volume up.
• No sound from rear DAP speakers.	• R/DAP LEVEL MUTE button ⑩ of the remote controller is pushed, and the MUTE indicator ❾ is flickering. • The volume of each connected amplifier is lowered.	• Push the MUTE button ⑩ to cancel muting. • Turn the volume up.
• Sound from the main speakers mismatches the sound from the DAP speakers (when the DIGITAL DIRECT switch ❸ is ON).	• Main signal amplifier is a digital amplifier with a larger delay time.	• Adjust the offset delay to compensate the delay time between digital in and speaker out.
• No control by remote controller.	• Distance and angle between remote sensor ❶ and remote controller are not proper. • Battery may need replacement.	• Use the remote controller within a range of 7 m (23 ft) and 30 deg. • Replace the battery with new ones.
• Less feeling of a live performance.	• DAP MODE switch ㉘ on the rear panel is set to 4-channel in spite of 6-channel reproducing system. • Unbalanced. • Volume of F/DAP and R/DAP amplifiers is lowered.	• Set the DAP MODE switch ㉘ on the rear panel to 6 Channel. • Push the INPUT LEVEL button ⑰ twice to set INPUT BALANCE mode, and adjust the balance using the DOWN ㉙ and UP ㉗ buttons or the −/+ button ⑥ of the remote controller. • Turn the volume up.
• The indicator light does not move.	• The remote controller DISPLAY key has been pressed.	• Press the remote controller DISPLAY key twice. (See page 16.)

SPECIFICATIONS

- Input Terminals : (32 kHz/44.1 kHz/48 kHz) Automatic sampling frequency selection
  - DIGITAL: OPTICAL LINE IN, COAXIAL LINE IN, COAXIAL DAT PLAY
  - ANALOG: LINE IN, TAPE PLAY
- Output terminals
  - DIGITAL: OPTICAL THRU OUT, COAXIAL THRU OUT, COAXIAL DAT REC
  - ANALOG: MAIN-OUT, FRONT DAP OUT, REAR DAP OUT, TAPE REC
- Input Sensitivity/Impedance: 550 mV/47 kΩ (LINE IN, TAPE PLAY)
- Maximum Output Level/Impedance: 5 V/660 Ω (FRONT DAP OUT, REAR DAP OUT)
- Total Harmonic Distortion:
  - MAIN OUT: 0.002% (ANALOG, 1 kHz)
  - DAP OUT: 0.004% (DIGITAL, 1 kHz), 0.005% (ANALOG, 1 kHz)
- Frequency Response:
  - MAIN OUT: 5 Hz ~ 100 kHz +0, −3 dB (ANALOG)
  - DAP OUT: 5 Hz ~ 20 kHz, +0.5, −1 dB (DIGITAL), 5 Hz ~ 20 kHz, +0.5, −3 dB (ANALOG)
- Dynamic Range :
  - DAP OUT: 94 dB (DIGITAL), 94 dB (ANALOG)
- Signal-to-Noise Ratio :
  - MAIN OUT: 110 dB (ANALOG)
  - DAP OUT: 100 dB (DIGITAL), 94 dB (ANALOG)
- D/A Converter : 16 bit linear, with 4 times over-sampling digital filter
- A/D Converter : 64 times oversampling 16 bit A/D converter (L/R Independent)
- Number of Sound Field Patterns
  - Programed : 20
  - Manual : 20
- Dimensions (W × H × D) : 435 × 101 × 360 mm, 17-3/16 × 4 × 14-3/16 inches
- Weight : 5.8 kg, 15 lbs.
- Power Consumption : 25 W
- Line Voltage & Frequency : AC 120 V ∿, 60 Hz
- Accessories : Optical Fiber Cable 1 m (3.28 ft) × 1, Audio Signal Cable 1 m (3.28 ft) × 4, Remote control unit × 1, Batteries × 2

Design and specifications subject to change without notice.

POWER SPECIFICATIONS

Areas	Line Voltage & Frequency	Power Consumption
U.S.A.	AC 120 V ∿ , 60 Hz	25 watts
Canada		
Continental Europe	AC 220 V ∿ , 50 Hz	
U.K.	AC 240 V ∿ , 50 Hz	
Australia		
Other areas	AC 110 / 120 / 220 / 240 V ∿ selectable, 50/60 Hz	

(No. 20120) 1-17

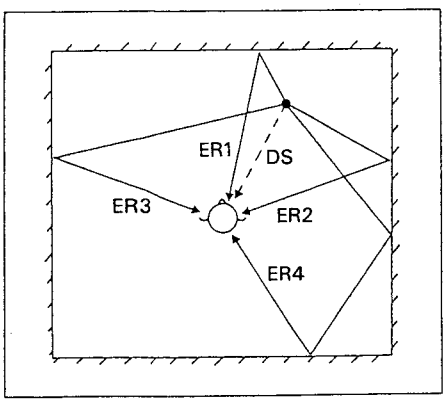
XP-A1010TN

Description of New Technology

Patterns of Sound

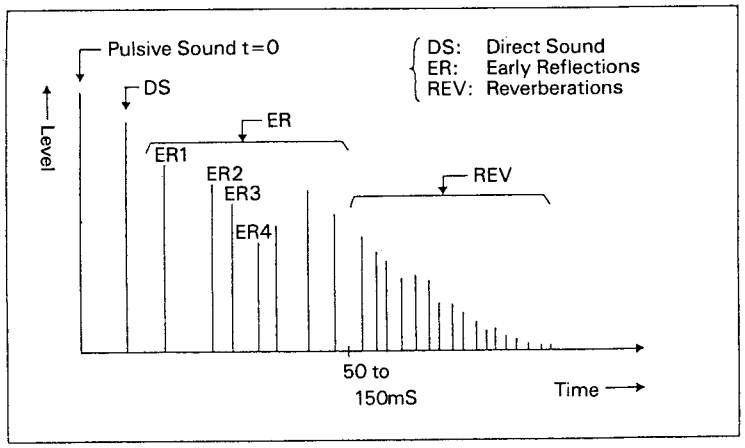
The acoustic patterns in the live performance space can be classified into three types: direct sound, early reflections, and reverberations. Early reflections are created when the sound is reflected off walls a few times before reaching the listener. Each early reflection has its own direction and sound intensity and is the most important factor in determining the acoustic characteristics of the performance space. (See Fig. 1 & Fig. 2)

Fig. 1 THE PATTERNS OF EARLY REFLECTIONS



Early reflections reach the listener from various directions

Fig. 2 PATTERNS OF SOUND



Typical Patterns of Sound

Acoustic Characteristics of a Concert Hall

The reflected sound heard in a concert hall varies in character depending on direction and intensity. Their distribution can be plotted as shown in the Distribution Pattern for Virtual Image Source Locations (Figs. 2a through 2e.). The centre of the many circles represents the virtual image source locations; the size of the circle indicates sound intensity. These figures show that the distribution changes as the measuring position (represented by the cross section of the horizontal and vertical lines) changes. (Figs. 2a and b.) The same is true when the position of the sound source is moved across the stage of the hall. (See Figs. 2c, 2d and 2e.)

DISTRIBUTION PATTERN OF VIRTUAL IMAGE SOURCE LOCATIONS

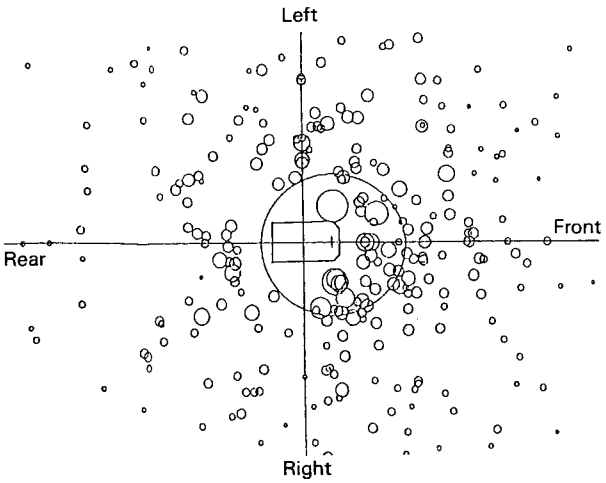


Fig. 2a Location of Sound Source: Centre on the Stage
Location of Measurement: Centre-Front

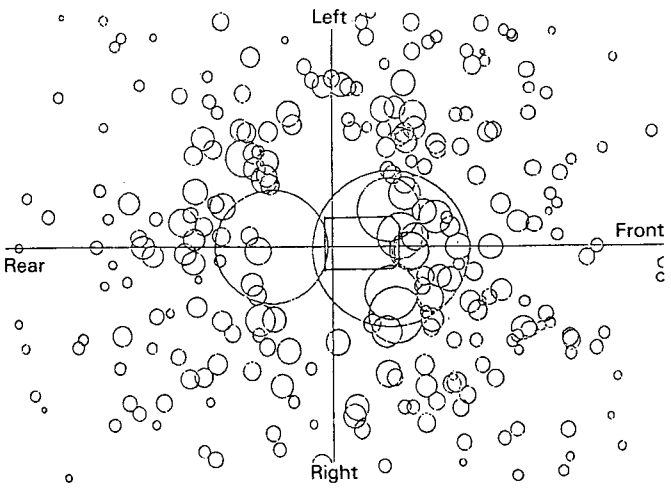


Fig. 2b Location of Sound Source: Centre on the Stage
Location of Measurement: Centre-Rear

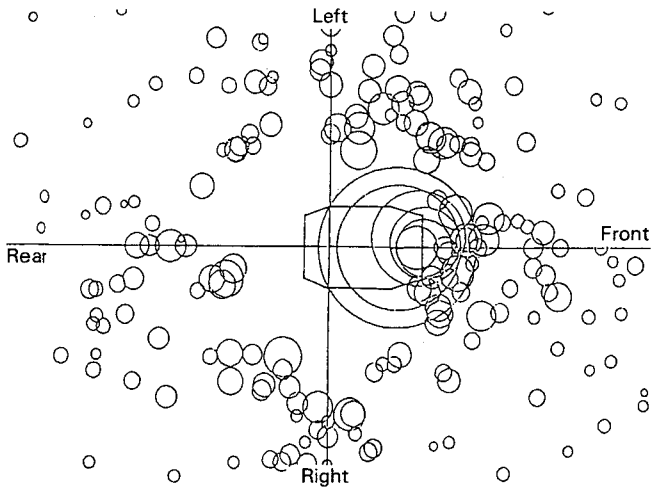


Fig. 2c Location of Sound Source: Centre on the Stage
Location of Measurement: Centre-Front on the 2nd Floor

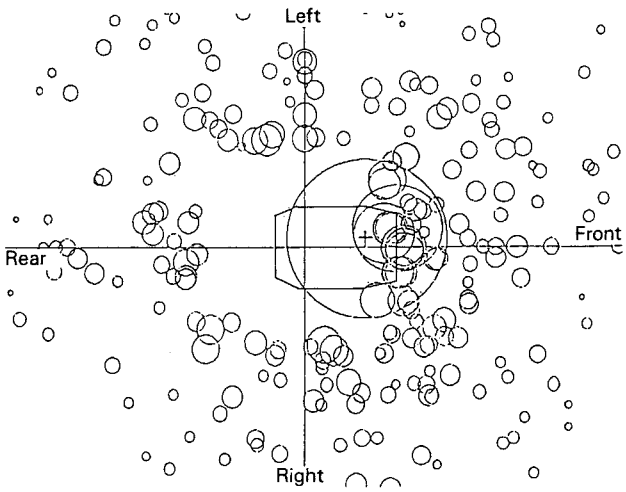


Fig. 2d Location of Sound Source: Left on the Stage
Location of Measurement: Centre-Front on the 2nd Floor

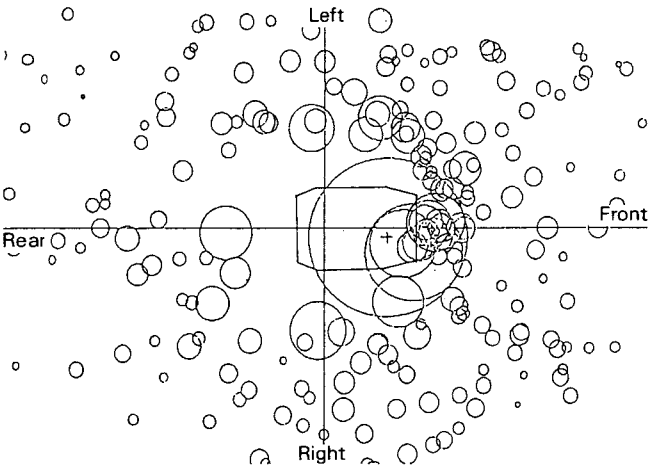
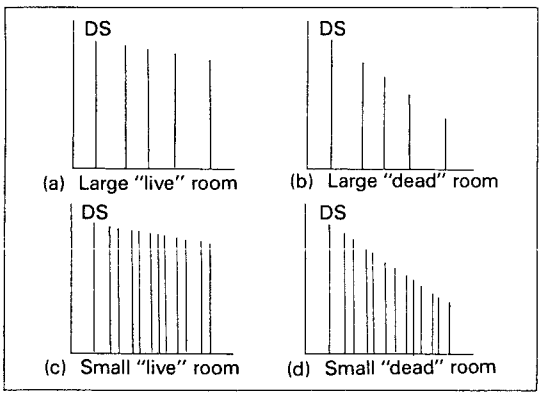


Fig. 2e Location of Sound Source Right on the Stage
Location of Measurement: Centre-Front on the 2nd Floor

Acoustic Characteristics of the Listening Room

As can be seen in Fig. 3a, the pattern of early reflections in a typical listening room varies according to the size of the room and how its walls and ceiling reflect sound. As for the distribution pattern of the virtual image source, the number of circles representing the reflected sound differs in a "live" room (Fig. 3b) and a "dead" room (Fig. 3c), but the basic distribution patterns remain the same.

Fig. 3a EARLY REFLECTION PATTERNS AND ROOM ACOUSTICS



DISTRIBUTION PATTERN OF VIRTUAL IMAGE SOURCE LOCATIONS IN A "LIVE" LISTENING ROOM

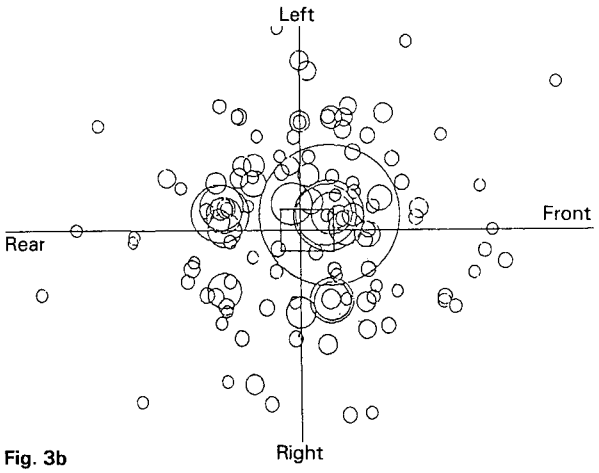


Fig. 3b

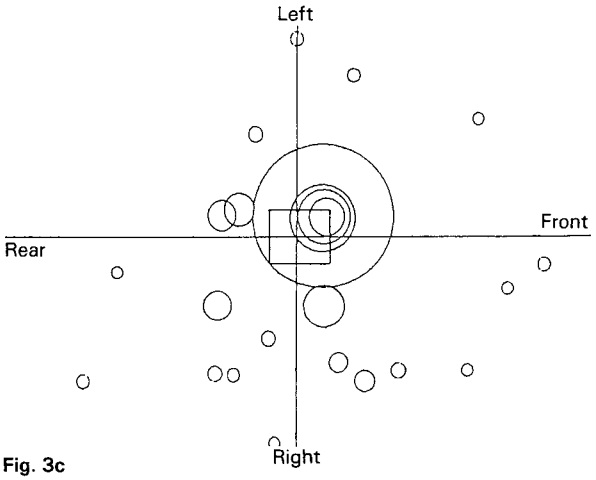
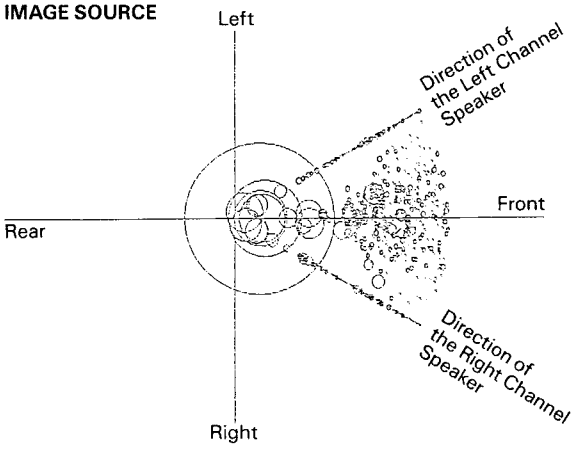


Fig. 3c

The Sound Field in the Recording Source

In order to measure acoustic parameters contained in a given recording, JVC went to actual halls and made recordings using microphone setups for solo instruments, orchestras, and chorus to measure the early reflections and reverberations that would emerge between the speakers in a conventional stereo system. (See Fig. 4.)

DISTRIBUTION PATTERN OF VIRTUAL IMAGE SOURCE LOCATIONS USING A 2-CHANNEL STEREO SOUND SOURCE



Total Sound Field Reproduction of the DAP System

Let's see how sound degradation can occur if the acoustics of the listening room and the recording site are not considered in the signal processing for a sound field simulation. Suppose an acoustic processor is to simulate a hall having the distribution pattern shown on Fig. 5a. The processor simply takes a few reflections of the highest intensity from the distribution pattern of the hall and adds the acoustic parameters to the original sound creating the distribution pattern in Fig. 4. When these sound signals are reproduced in a listening room having the distribution pattern of Fig. 5b, the result is an excessive reflections shown in Fig. 5c. This is how simulation is done with conventional simulation systems. With the JVC DAP (Digital Audio Processor) system, this problem is avoided because reflection parameters are handled one at a time; the next parameter is only processed when the preceding one is calculated and compared with the actual distribution pattern of the hall. A significant improvement can be seen in Fig. 5d (compare it with Fig. 5c) where the JVC DAP simulates the sound field of the hall in the Fig. 5a.

Fig. 5a VIRTUAL IMAGE SOURCE PATTERN OF AN ACTUAL HALL (SIMULATION TARGET)

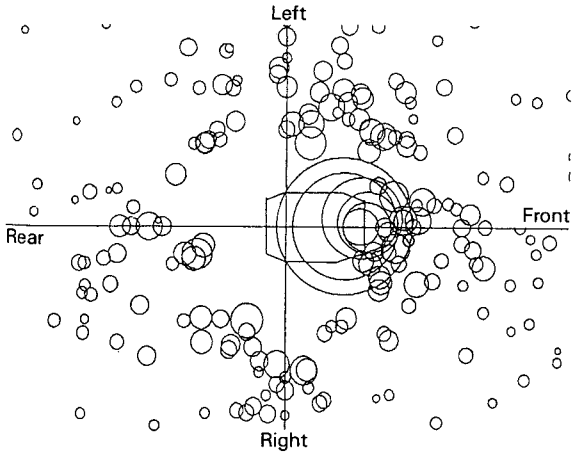


Fig. 5b VIRTUAL IMAGE SOURCE PATTERN OF A LISTENING ROOM

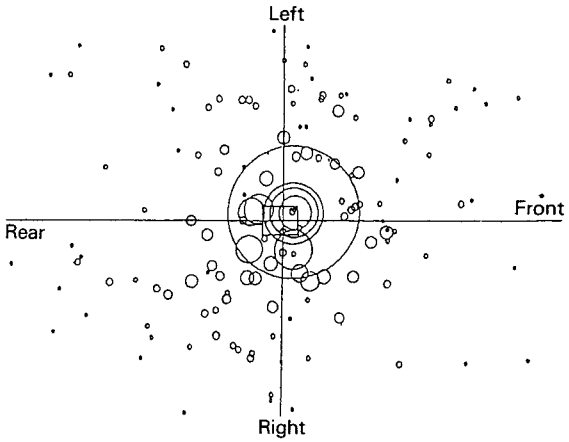


Fig. 5c VIRTUAL IMAGE SOURCE PATTERN REPRODUCED BY CONVENTIONAL SIMULATION

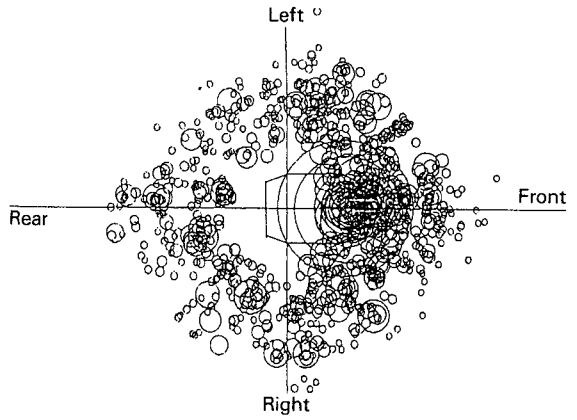
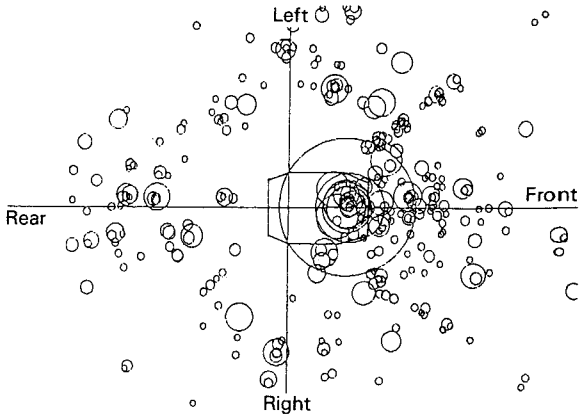


Fig. 5d VIRTUAL IMAGE SOURCE PATTERNS REPRODUCED BY THE DAP SYSTEM



JVC's Original Sound Field Analysis Using Stereo Sound Source

Studying Figs. 2c, 2d, and 2e reveals that there is a significant change in the distribution pattern even if the position of the sound source is changed only slightly. This is due to the change of the reflection patterns as shown in Fig. 6a. In the figure, different reflection patterns occur when the sound source is placed at the centre, right, and left of the stage. Technically, this difference is indicated in Fig. 6b as d_{RR} and d_{LR} for the sound source on the right and the left of the stage, respectively. This difference in distance illustrates that the sound field in a hall changes as the sound source changes from solo instruments to large orchestra, even if the listening position remains the same. JVC's DAP system makes it possible to analyze the sound field more accurately, no matter what the size of the sound source may be.

Fig. 6a EARLY REFLECTION PATTERNS AND LOCATION OF THE SOUND SOURCE

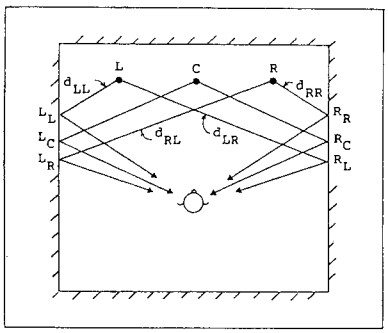
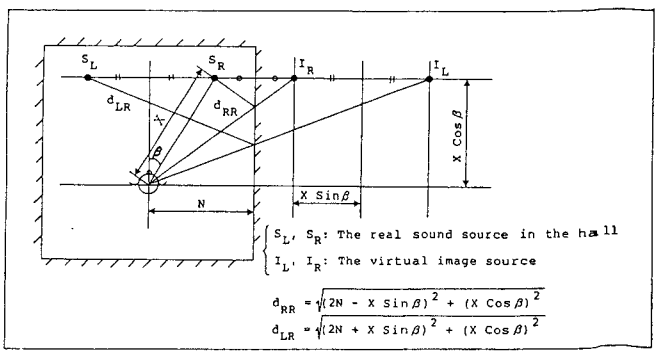


Fig. 6b ANALYSIS OF THE SOUND FIELD OF A HALL USING TWO SOUND SOURCES



DAP Block Diagram

Fig. 7 shows the tentative block diagram of our digital acoustics processor. A total of three VLSI (Very Large-Scale Integrated) circuits (see Fig. 8) are used for digital processing to provide high-quality reproduction of sound fields.

Fig. 7 TENTATIVE BLOCK DIAGRAM OF THE DIGITAL ACOUSTICS PROCESSOR

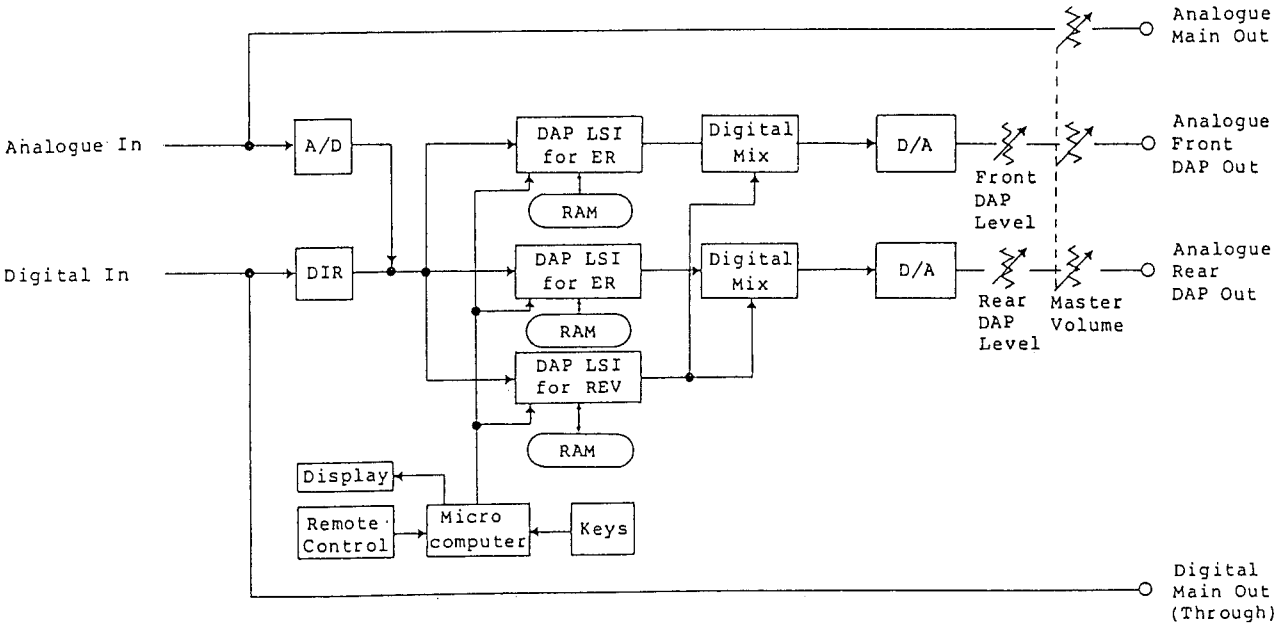
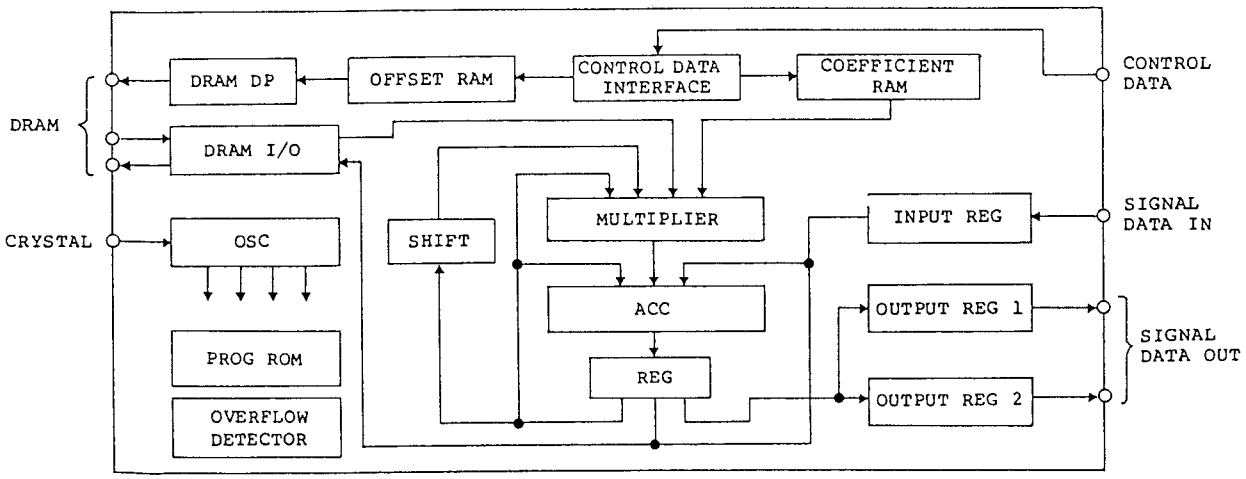


Fig. 8 BLOCK DIAGRAM OF THE CUSTOMIZED VLSI CIRCUIT



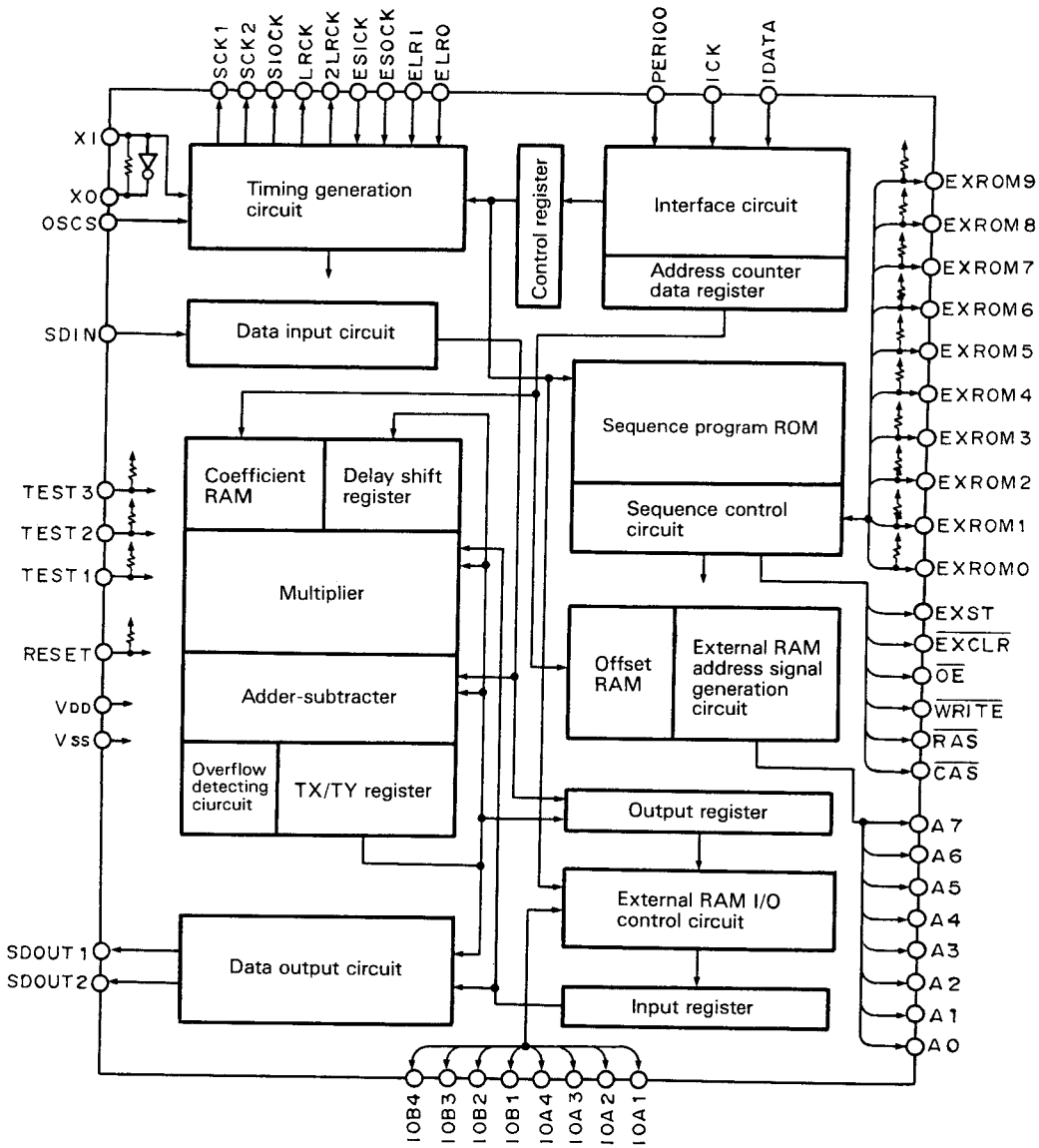
Description of Major LSI

■VC4097-003 (IC606, 607), VC4097-002 (IC605)·····DIGITAL SIGNAL PROCESSOR (DSP)

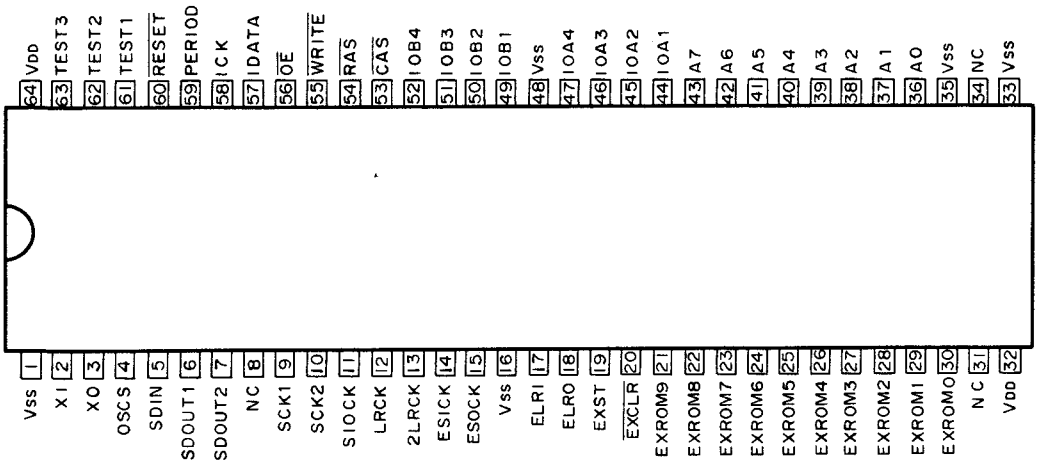
(1) General:

The VC4097 is a single chip digital acoustic signal processor for sound-field control. It provides many advantages, such as, highly-precise digital delay with high quality that cannot be performed by an analog delay system, read/write of digital sound field data, various audio-visual (AV) digital surround effects with high-grade thruput simultaneously executing arithmetic operations, and simulation of the natural reverberation of a hall, stage, stadium, etc., by folding the initial reflected sound and calculating reverberation.

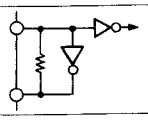
(2) Internal Block Diagram



(3) Sketch drawing



(4) Functions of terminals

Terminal No.	Signal Name	I/O	Summary of Functions	Remarks
1	VSS	—	Ground terminal	
2	XI	I	Connects to crystal oscillator or provides an external clock signal to XI terminal. Equipped with a built-in feedback resistance.	
3	XO	O		
4	OSCS	I	Oscillator/external clock frequency switching terminal.	
5	SDIN	I	L-ch and R-ch serial data input terminal.	Schmidt input.
6	SDOUT1	O	L-ch and R-ch serial data output terminal.	
7	SDOUT2	O		
8	NC	—	Un-connected terminal.	
9	SCK1	O	OSCS=L: XI clock buffer output terminal. OSCS=H: XI clock half-frequency output terminal.	
10	SCK2	O	OSCS=L: XI clock half-frequency output terminal. OSCS=H: XI clock quarter-frequency output terminal.	
11	SIOCK	O	Data shift clock output terminal for A/D and D/A converters.	Internal generation mode
12	LRCK	O	Channel clock output terminal for A/D and D/A converters.	Same as above
13	2LRCK	O	Double LRCK frequency clock output terminal.	Same as above
14	ESICK	I	Shift clock input terminal for fetching of L-ch and R-ch serial data.	External input mode, Schmidt input.
15	ESOCK	I	Shift clock input terminal for output of L-ch and R-ch serial data.	Same as above
16	VSS	—	Ground terminal	
17	ELRI	I	Channel clock input terminal for the Lch and R-ch serial input data.	External input mode, Schmidt input
18	ELRO	I	Channel clock input terminal for the L-ch and R-ch serial output data.	Same as above
19	EXST	O	Program sequence ROM start pulse output terminal.	Used in external ROM mode
20	$\overline{\text{EXCLR}}$	O	System clear signal output terminal.	Same as above
21	EXROM9	I	External ROM data input terminal. Equipped with a built-in pull-up resistance.	Same as above
22	EXROM8	I		
23 ~ 30	EXROM7 ~ EXROM0	I/O	External ROM data input terminal (output terminal during test). Equipped with a built-in pull-up resistance.	Used in external ROM mode.

Terminal No.	Signal Name	I/O	Summary of Functions	Remarks
31	NC	—	Unconnected terminal.	
32	VDD	—	Power source terminal.	
33	VSS	—	Ground terminal.	
34	NC	—	Unconnected terminal.	
35	VDD	—	Ground terminal.	
36 to 43	A0 to A7	O	External DRAM address output terminal.	
44 to 47 49 to 52	IOA1 to IOA4 IOB1 to IOB4	I/O	External DRAM data I/O terminal. Only IOA1 to IOA4 are used in four-bit access mode.	
48	VSS	—	Ground terminal.	
53	$\overline{CAS}$	O	External DRAM column address strobe output terminal.	
54	$\overline{RAS}$	O	External DRAM low address strobe output terminal.	
55	$\overline{WRITE}$	O	External DRAM read/write pulse output terminal.	
56	$\overline{OE}$	O	External DRAM enable pulse output terminal.	
57	IDATA	I	Interface period pulse input terminal.	Schmidt input
58	ICK	I	Interface clock input terminal.	Same as above
59	PERIOD	I	Interface period pulse input termianl.	Schmidt input
60	$\overline{RESET}$	I	Reset signal input terminal. Equipped with a built-in pull-up resistance.	
61 to 63	TEST1 to TEST3	I	Test terminal. Usually used at H or open. Equipped with a built-in pull-up resistance.	
64	VDD	—	Power source terminal.	

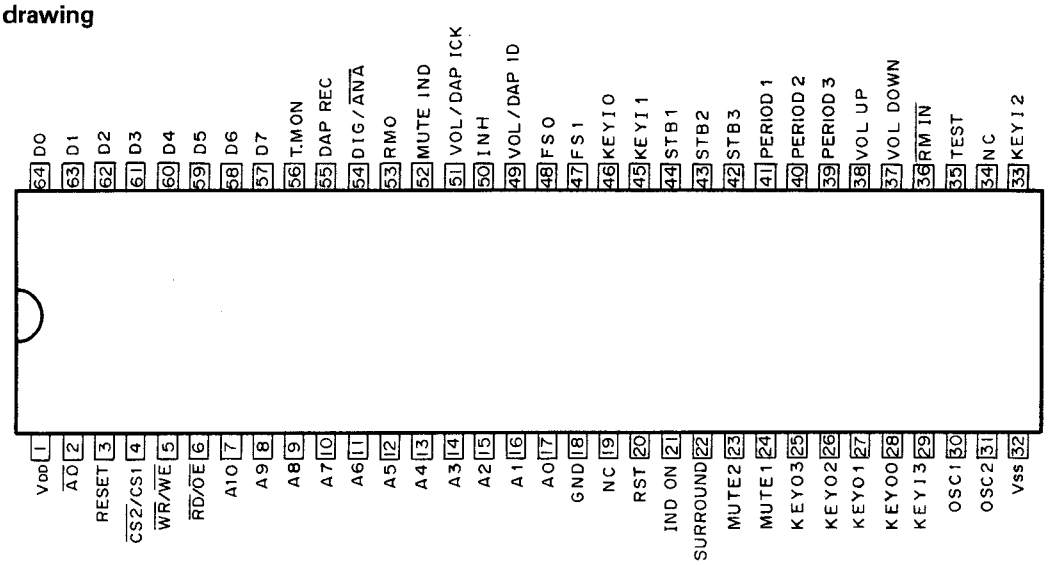
■ MN188321JSR3 (IC601) ..... MICROCOMPUTER

(1) General:

MN188321 is a single-chip dual CPU microcomputer. These two CPUs can execute programs in a time sharing mode. It has a built-in 32K-byte ROM, a 448 byte RAM and the following peripheral functions: one 8-bit synchronous serial system, one 8-bit asynchronous serial communication system (Universal Asynchronous Receiver Transmitter: UART), five 16-bit timer counters and two external interrupt inputs. The MN188321 has a switchable two-speed system clock using two built-in oscillation circuits (8 MHz and 32 kHz). The machine cycle is a minimum of 0.5μs (8 MHz) and is indicated by pin 64 SDIP/QFP.

The microcomputer receives signals from the operation keys and the remote controller, sends data to the indicators, sends the DSP LSIs control data and addresses for the SRAM, and processes input/output data to save manual programs and control muting and volume.

(2) Sketch drawing



(3) Functions of terminals

Terminal No.	Signal Name	I/O	Summary of Functions
1	VDD	—	+5V
2	$\overline{A0}$	O	To display A0
3	RESET	O	To Display RESET (Level "H" when the character display is OFF)
4	$\overline{CS2}$/CS1	O	To Display $\overline{CS2}$, SRAM CS1
5	$\overline{WR}/\overline{WE}$	O	To Display $\overline{WR}$, SRAM $\overline{WE}$
6	$\overline{RD}/\overline{OE}$	O	To Display $\overline{RD}$, SRAM $\overline{OE}$
7	A10	O	SRAM address 10
8	A9	O	SRAM address 9
9	A8	O	SRAM address 8
10	A7	O	SRAM address 7
11	A6	O	SRAM address 6
12	A5	O	SRAM address 5
13	A4	O	SRAM address 4
14	A3	O	SRAM address 3
15	A2	O	SRAM address 2
16	A1	O	SRAM address 1

Terminal No.	Signal Name	I/O	Summary of Functions
17	A0	O	SRAM address 0
18	GND	—	Connected to the ground
19	NC	—	
20	RST	I	Power-on reset for microcomputer
21	IND ON	O	Outputs Level "H" when the input indicator is ON.
22	SURROUND	O	Outputs Level "H" in SURROUND mode.
23	MUTE2	O	MUTE output 2
24	MUTE1	O	MUTE output 1
25	KEY 03	O	Key output
26	KEY 02	O	
27	KEY 01	O	
28	KEY 00	O	
29	KEY I3	I	Key input
30	OSC1	I	Terminal of oscillator for master clock
31	OSC2	O	Terminal of oscillator for master clock
32	Vss	—	Ground terminal
33	KEY I2	I	Key input
34	NC	—	
35	TEST	I	Test mode input
36	$\overline{\text{RM IN}}$	I	Remote controller input
37	VOL DOWN	O	Volume down output
38	VOL UP	O	Volume up output
39	PERIOD 3	O	To DSP PERIOD
40	PERIOD 2	O	
41	PERIOD 1	O	
42	STB 3	O	To TC9176 STROBE Terminal
43	STB 2	O	
44	STB 1	O	
45	KEY I1	I	Key input
46	KEY I0	I	
47	FS 1	I	FS input
48	FS 0	I	
49	VOL/DAP ID	O	To DSP, TC9176 DATA
50	INH	I	Inhibit input (power souce detection)
51	VOL/DAP ICK	O	TO DSP, TC9176 CLK
52	MUTE IND	O	Outputs Level "H" when MASTER MUTE is ON.
53	RMO	O	Outputs Level "H" when receiving signals from the remote controller.
54	DIG/$\overline{\text{ANA}}$	O	Outputs Level "H" during digital DIRECT
55	DAP REC	O	Outputs Level "H" during REC.
56	T.MON	O	Outputs Level "H" during TAPE MONITOR
57	D7	I/O	To Display, SRAM data 7
58	D6	I/O	To Display, SRAM data 6
59	D5	I/O	To Display, SRAM data 5
60	D4	I/O	To Display, SRAM data 4
61	D3	I/O	To Display, SRAM data 3
62	D2	I/O	To Display, SRAM data 2
63	D1	I/O	To Display, SRAM data 1
64	D0	I/O	To Display, SRAM data 0

FS	32	44.1	48
FS 1	H	L	H
FS 0	H	L	L

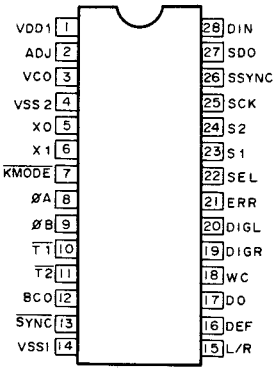
■ YM3623B (IC701) ..... LSI FOR RECEIVING AND REPRODUCING THE DIGITAL AUDIO INTERFACE FORMAT SIGNAL

(1) General:

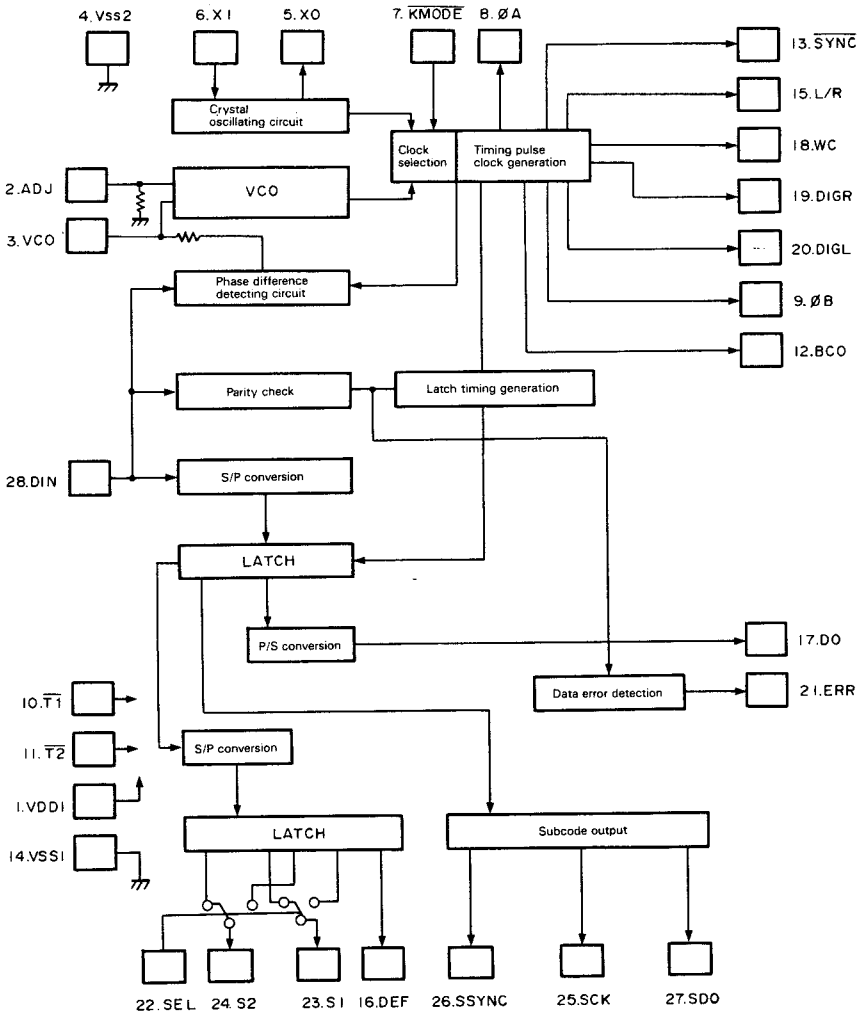
YM3623B performs the following functions:

1. Internal PLL circuit and synchronization with the external digital audio format signal. Thus, the sampling frequency automatically follows the signal.
2. Outputs the audio signal with MSB first, and outputs, synchronously with the audio signal, the signals which indicate the D/A output sample hold timing clock, left channel and right channel.
3. The terminal for output of subcodes, and can fetch subcode data.
4. Outputs the sampling frequency, copy enable, presence of emphasis and presence of errors of transferred audio signals.
5. Re-outputs the previous audio data if a digital audio interface format signal error is detected.

(2) Sketch drawing



(3) Internal block diagram



(4) Functions of terminals

Pin No.	Terminal Name	I/O	Functions
1	V_{DD1}		System power source (+5V)
2	ADJ	I	VCO oscillation frequency adjusting terminal, unconnected.
3	VCO	I/O	External capacitor terminal for the VCO circuit.
4	V_{SS2}		VCO circuit ground. Connect this terminal in the same way as V_{SS1}. It is not connected in the same way in the LSI.
5	XO	O	Crystal oscillator terminal (16.9344 MHz)
6	XI	I	Crystal oscillator terminal
7	$\overline{KMODE}$	I (PU)	H: Operates the PLL circuit if the DIN terminal receives the input signal, otherwise, operates it using the crystal oscillator. L: Uses the crystal oscillator regardless of the DIN terminal.
8	ϕA	O	16.9344 MHz when the crystal oscillator is used, and varies depending upon the DIN terminal input data speed when the PLL circuit is operated. (about 16.9344 MHz when fs=44.1 kHz)
9	ϕB	O	1/3 of the frequency of Terminal ϕA when the crystal oscillator is used, and varies depending upon the DIN teminal input data speed when the PLL circuit is operated. (about 5.6448 MHz when fs=44.1 kHz)
10	$\overline{T1}$	I (PU)	Internal circuit check terminal.
11	$\overline{T2}$	I (PU)	Internal circuit check terminal.
12	BCO	O	Timing clock of the signal output from the DO terminal.
13	$\overline{SYNC}$	O	Synchronizing singal.
14	V_{SS1}	O	System ground (+0V)
15	L/R	O	Indicates that L-ch and R-ch data is output from the DO terminal at Level H and L, respectively.
16	DEF	O	H: Indicates that input data has been emphasized. L: Indicates that input data has not been emphasized.
17	DO	O	16-bit data output
18	WC	O	Indicates that data is output to the DO terminal.
19	DIGR	O	R-ch deglitch signal
20	DIGL	O	L-ch deglitch signal
21	ERR	O	H: Parity error, or operating with a crystal L: No error
22	SEL	I (PU)	See the following table.
23	S1	O	See the following table.
24	S2	O	See the following table.
25	SCK	O	Subcode output clock.
26	SSYNC	O	Subcode signal.
27	SDO	O	Subcode data output terminal.
28	DIN	I(PU)	Data input terminal.

Terminals marked with (PU) have been pulled up inside the chip.

Terminals S1, S2 and SEL

Terminals S1 and S2 have the multiplier output functions. The S1/S2 terminal output is switched by switching the SEL terminal input.

Input	Output		Output	
SEL	S1	Function	S2	Function
L	L	Inhibits copying.	L	CD (other than DAT)
	H	Enables copying.	H	DAT
H	L		L	DIN input signal sampling frequency of 44.1 kHz
	L		H	48 kHz
	H		H	32 kHz
	H		L	——

As shown in the above table, the SEL terminal extracts the necessary data from the digital audio interface format signal input, and outputs it to terminals S1 and S2.

■ MN86081 (IC407, 408) ..... A/D CONVERTER (MASH-SYSTEM)

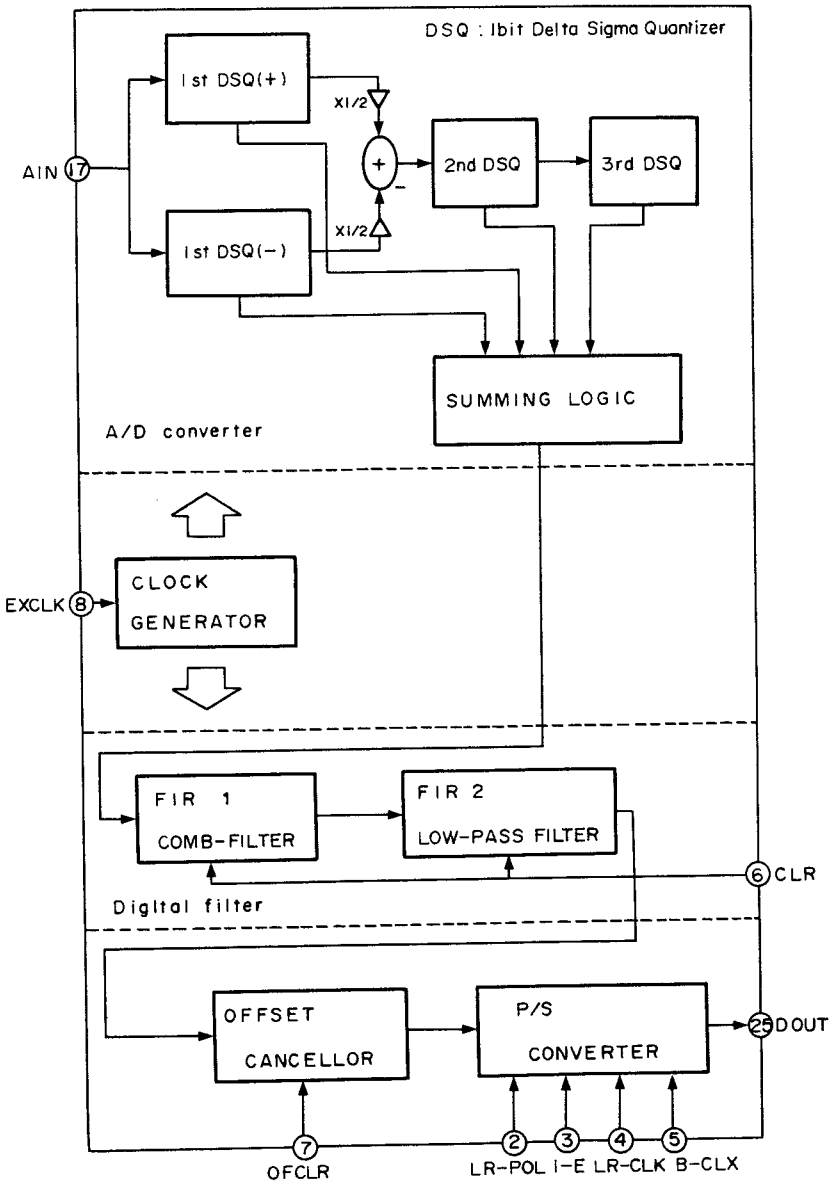
(1) General:

MN86081 is a 16-bit A/D converter with a built in digital filter which has been developed for PCM digital audio equipment. It converts an analog signal to a 16-bit digital signal using the Multi-Stage Noise Shaping (MASH) system (see Note). The built-in digital filter has allowed the front-end analog filter of the A/D converter to be more simplified than a conventional standard one, consequently, it can reduce the total power consumption of the entire A/D conversion system. The MN86081 can be used in digital AV equipment for dynamic address translation (DAT) to achieve large-scale economization and small size.

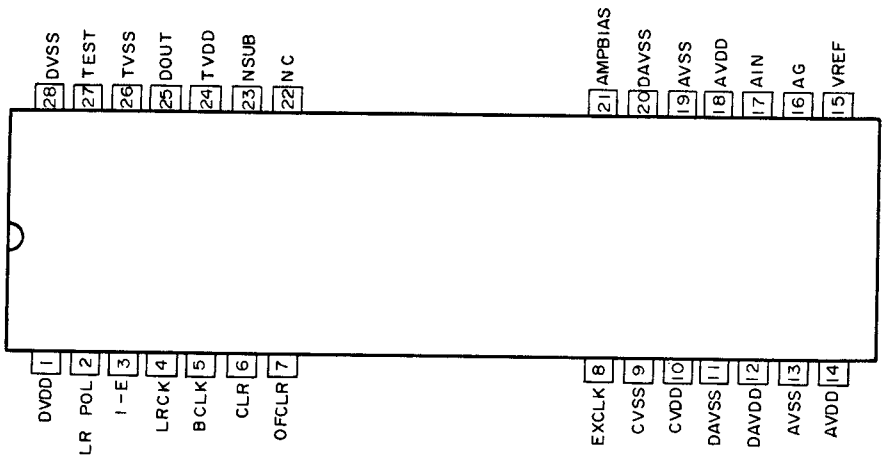
Note: The MASH is an over-sampling A/D conversion technique to enable high S/N ratio by connecting 1-bit quantizers in multiple stages over three stages without a trimming process.
*MASH was designed by Nippon Telephone and Telegraph Co. (NTT).

*MASH: Registered trademark has been applied for.

(2) Internal block diagram



(3) Sketch drawing

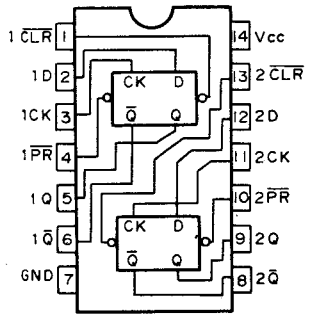


(4) Functions of Terminals

Terminal No.	Terminal Name	I/O	Summary of Functions
1	D VDD	—	Digital power source terminal (+5V)
2	LRPOL	I	L-ch/R-ch switching terminal in stereo mode
3	I–E	I	EiAj format at L, I²S format at H.
4	LRCK	I	LRCK input terminal in stereo mode: H: R-ch data output, L: High impedance when LRPOL at H. L: L-ch data output, L: High impedance when LRPOL at L.
5	BCLK	I	Bit transfer instruction input (bit transfer is even at trailing edge)
6	CLR	I	Clear terminal.
7	OFCLR	I	Offset clear circuit operation at L
8	EXCLK	I	512FS input terminal
9	C VSS	—	Digital ground terminal
10	C VDD	—	Digital power source terminal (+5V)
11	DA VSS	—	Digital ground terminal.
12	DA VDD	—	Digital power source terminal (+5V)
13	A VSS	—	Analog ground terminal
14	A VDD	—	Analog power source terminal (+5V)
15	VREF	—	Analog section reference voltage input terminal (+1.5V)
16	AG	—	Analog ground input terminal (+2.5V)
17	AIN	I	Analog input terminal
18	A VDD	—	Analog power source terminal (+5V)
19	A VSS	—	Analog ground terminal
20	DA VSS	—	Digital ground terminal
21	AMPBIAS	I	Operation amplifier bias voltage adjusting terrminal (adjust the bias voltage between 1.0 and 4.0V to set a minimum value of THD)
22	NC	—	———————————
23	NSUB	I	Connected to A VDD terminal
24	T VDD	—	Digital power source terminal (+5V)
25	DOUT	O	Serial output terminal, 2's complement, MSB first
26	T VSS	—	Digital ground terminal
27	TEST	I	Usually connected to D VDD terminal
28	D VSS	—	Digital ground terminal

Outline of Other IC

■ TC74HC74P (IC602) ..... DUAL D FLIP FLOP WITH PRESET AND CLEAR

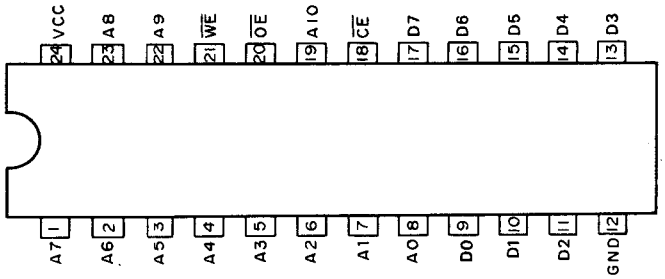


Truth value table

INPUTS				OUTPUTS		FUNCTION
$\overline{CLR}$	$\overline{PR}$	D	CK	Q	$\overline{Q}$	
L	H	*	*	L	H	CLEAR
H	L	*	*	H	L	PRESET
L	L	*	*	H	H	—
H	H	L	↑	L	H	—
H	H	H	↑	H	L	—
H	H	*	↓	Qn	$\overline{Q}$n	NO CHANGE

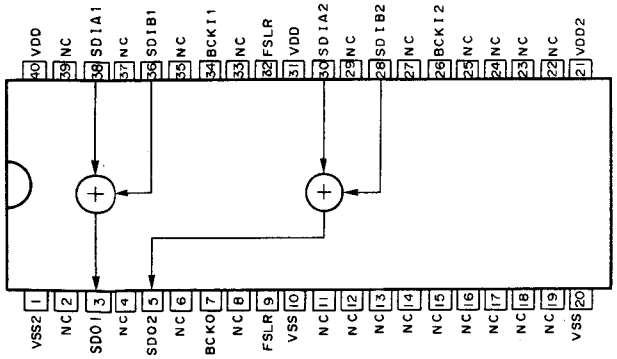
*: Don't care

■ LC3517BSL-15 (IC603) ..... 2048WORD BY 8-Bit STATIC RAM



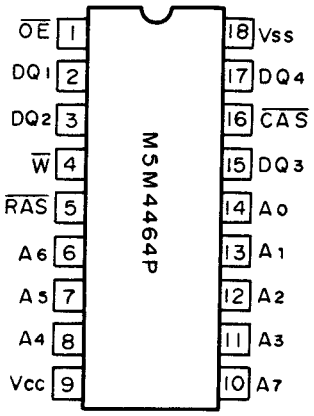
A0~A10	Address input terminal
$\overline{WE}$	Read/write control input terminal
$\overline{OE}$	Output enable input terminal
$\overline{CE}$	Chip enable input terminal
D0~D7	Data I/O
Vcc/GND	Power source terminal

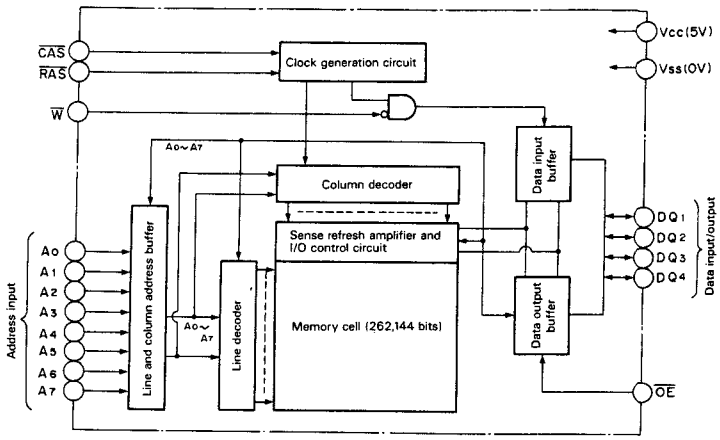
■ VC4096 (IC604) ..... GATE ARRAY FOR 16-Bit ADDER



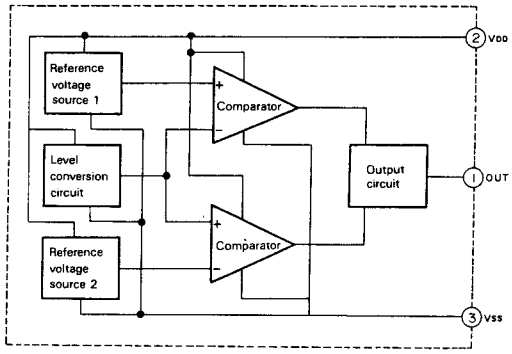
SDIA1+SDIB1→SD01
SDIA2+SDIB2→SD02
FSLR; FS (sampling frequency) input
BCKI1; BCKI2, BCKO; 32fs input

■ M5M4464P-12 (IC608 ~ IC613)·····65536 WORD BY 4-Bit DYNAMIC RAM



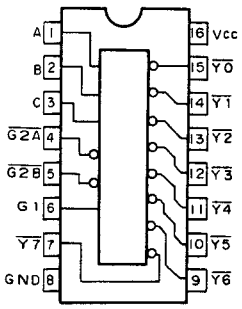


■ MN1280 (P.Q) (IC614) ..... RESET IC



PIN NO.	PIN NAME	FUNCTIONS
2	VDD	Power source voltage terminal
3	VSS	Ground terminal
1	OUT	Reset signal output terminal, outputs the low level during reset and the high level while reset is released.

■ TC74HC138P (IC801) ..... 3-TO-8 LINE DECORDER

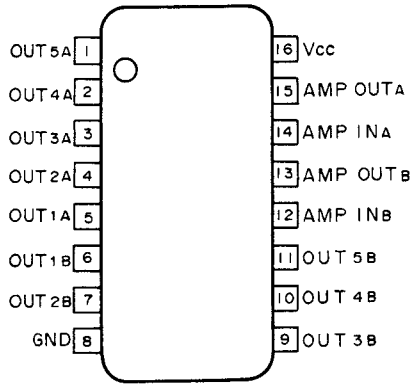


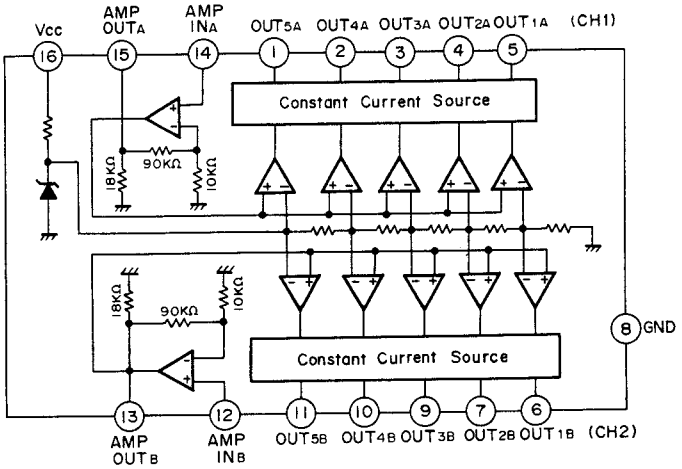
Truth value table

INPUTS						OUTPUTS								SELECTED OUTPUT
ENABLE			SELECT											
G1	$\overline{G2A}$	$\overline{G2B}$	C	B	A	$\overline{Y}_0$	$\overline{Y}_1$	$\overline{Y}_2$	$\overline{Y}_3$	$\overline{Y}_4$	$\overline{Y}_5$	$\overline{Y}_6$	$\overline{Y}_7$	
L	*	*	*	*	*	H	H	H	H	H	H	H	H	NONE
*	H	*	*	*	*	H	H	H	H	H	H	H	H	NONE
*	*	H	*	*	*	H	H	H	H	H	H	H	H	NONE
H	L	L	L	L	L	L	H	H	H	H	H	H	H	$\overline{Y}_0$
H	L	L	L	L	H	H	L	H	H	H	H	H	H	$\overline{Y}_1$
H	L	L	L	H	L	H	H	L	H	H	H	H	H	$\overline{Y}_2$
H	L	L	L	H	H	H	H	H	L	H	H	H	H	$\overline{Y}_3$
H	L	L	H	L	L	H	H	H	H	L	H	H	H	$\overline{Y}_4$
H	L	L	H	L	H	H	H	H	H	H	L	H	H	$\overline{Y}_5$
H	L	L	H	H	L	H	H	H	H	H	H	L	H	$\overline{Y}_6$
H	L	L	H	H	H	H	H	H	H	H	H	H	L	$\overline{Y}_7$

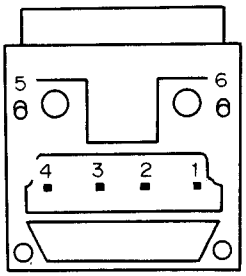
*: Don't care

■ IR2E27A (IC802) ..... 5 Dot × 2-Channel LED DISPLAY DRIVER





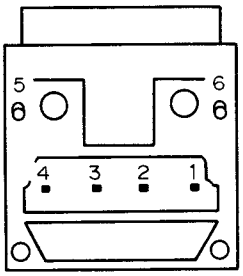
■ TOTX174 (J702) . . . . . OPTICAL TRANSMISSION MODULE



Bottom view

PIN NO.	CONNECTION
1	GND
2	LED current limit resistance
3	Vcc
4	Input
5	NC
6	NC

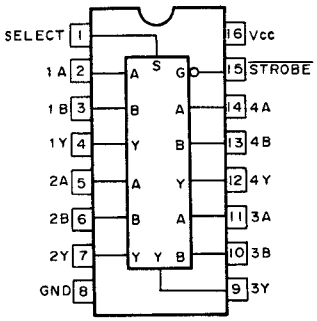
■ TORX174 (J701) . . . . . OPTICAL RECEPTION MODULE



Bottom view

PIN NO.	CONNECTION
1	Output
2	GND
3	Vcc
4	GND
5	Case
6	Case

■ TC74HC157P (IC708) ..... QUAD 2-CHANNEL MULTIPLEXER

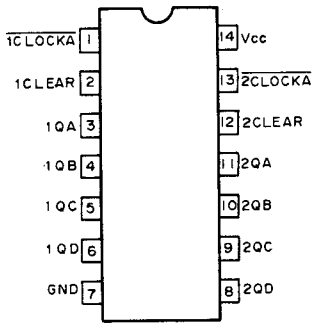


Truth value table

INPUTS				OUTPUT
$\overline{\text{STROBE}}$	SELECT	A	B	Y (157)
H	*	*	*	L
L	L	L	*	L
L	L	H	*	H
L	H	*	L	L
L	H	*	H	H

*: Don't care

■ TC74HC393P (IC707) ..... DUAL BINARY COUNTER

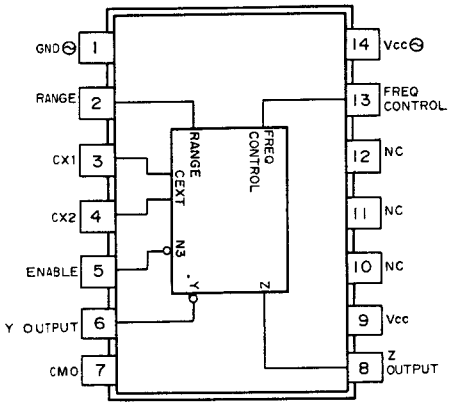


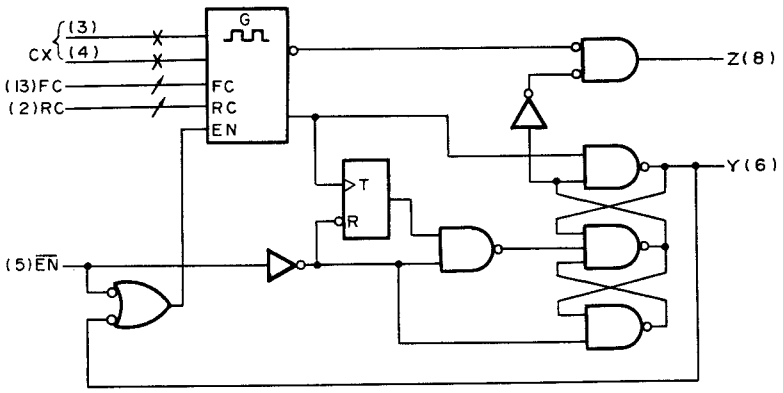
Truth value table

COUNT	OUTPUT			
	QD	QC	QB	QA
0	L	L	L	L
1	L	L	L	H
2	L	L	H	L
3	L	L	H	H
4	L	H	L	L
5	L	H	L	H
6	L	H	H	L
7	L	H	H	H
8	H	L	L	L
9	H	L	L	H
10	H	L	H	L
11	H	L	H	H
12	H	H	L	L
13	H	H	L	H
14	H	H	H	L
15	H	H	H	H

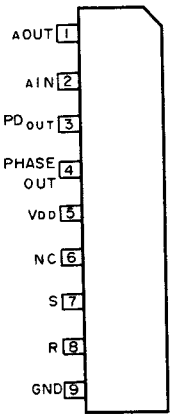
INPUTS		OUTPUTS			
$\overline{CLOCK}$	CLEAR	QA	QB	QC	QD
X	H	L	L	L	L
↓	L	COUNT UP			
↑	L	NO CHANGE			

■ SN74LS624S (IC709) ..... VOLTAGE CONTROLLED OSCILATOR

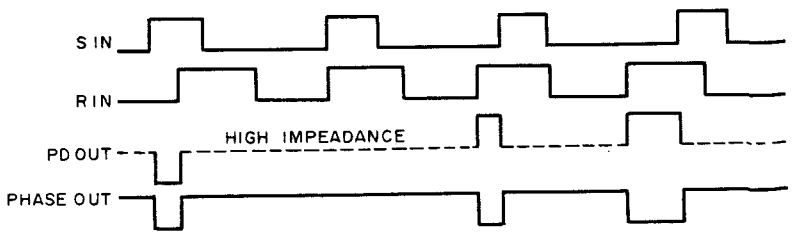


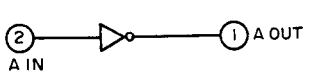


■ TC5081AP (IC711) ..... PHASE COMPARATOR

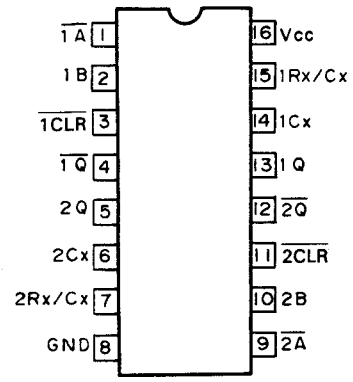


Phase comparator timing chart





■ TC74HC123P (IC706) ..... DUAL RETRIGGERABLE MONOSTABLE MULTIVIBRATOR



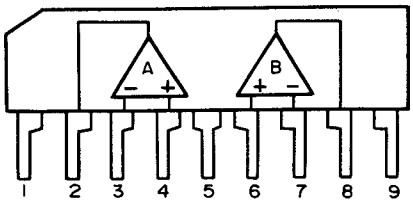
Truth value table

INPUTS			OUTPUTS		NOTE
$\overline{A}$	B	$\overline{CLR}$	Q	$\overline{Q}$	
↓	H	H	⊓	⊔	OUTPUT ENABLE
X	L	H	L	H	INHIBIT
H	X	H	L	H	INHIBIT
L	↓	H	⊓	⊔	OUTPUT ENABLE
L	H	↓	⊓	⊔	OUTPUT ENABLE
X	X	L	L	H	INHIBIT

X: Don't care.
Cx, Rx: External parts installation terminal

■ NJM3404S (IC710) ..... DUAL SINGLE SUPPLY OPERATIONAL AMPLIFIER

S TYPE



PIN ARRANGEMENT
1. V+
2. A OUTPUT
3. A − INPUT
4. A+INPUT
5. V−
6. B+INPUT
7. B − INPUT
8. B OUTPUT
9. V+

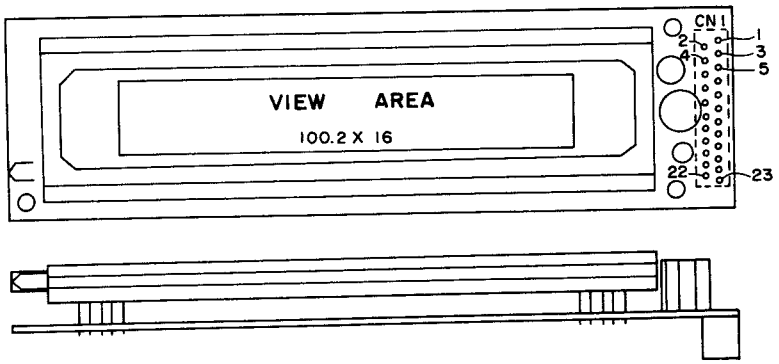
FL Display Tube

■ ELU0001-058 (FL001)

(1) General:

The ELU0001-058 is a single board display module consisting of a 40-character fluorescent display tube, refresh memory, character generator, control circuit.

(2) Sketch drawing



Pin No.	Signal
1	D7
2	D6
3	D5
4	D4
5	D3
6	D2
7	D1
8	D0
9	GND
10	$\overline{WR}$
11	A0
12	$\overline{RD}$
13	$\overline{CS}$
14	TO
15	RESET
16	GND
17	VCC
18	VCC
19	VBB
20	VBB
21	CT
22	VEF
23	VEF

CT: Filament AC voltage center tap
VEF: Filament AC voltage
TO: Not used

(3) Optical features

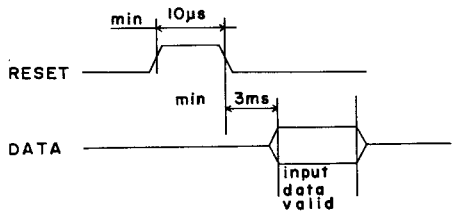
Display character ..... 20 characters, two lines
Character display form ..... 5 × 7 dots
Display range ..... 100.2 × 16 mm
Display character size ..... 3.3 × 5.05 mm
Display character pitch ..... 5.1 mm
Fluorescent color ..... Blue-green

(4) Function

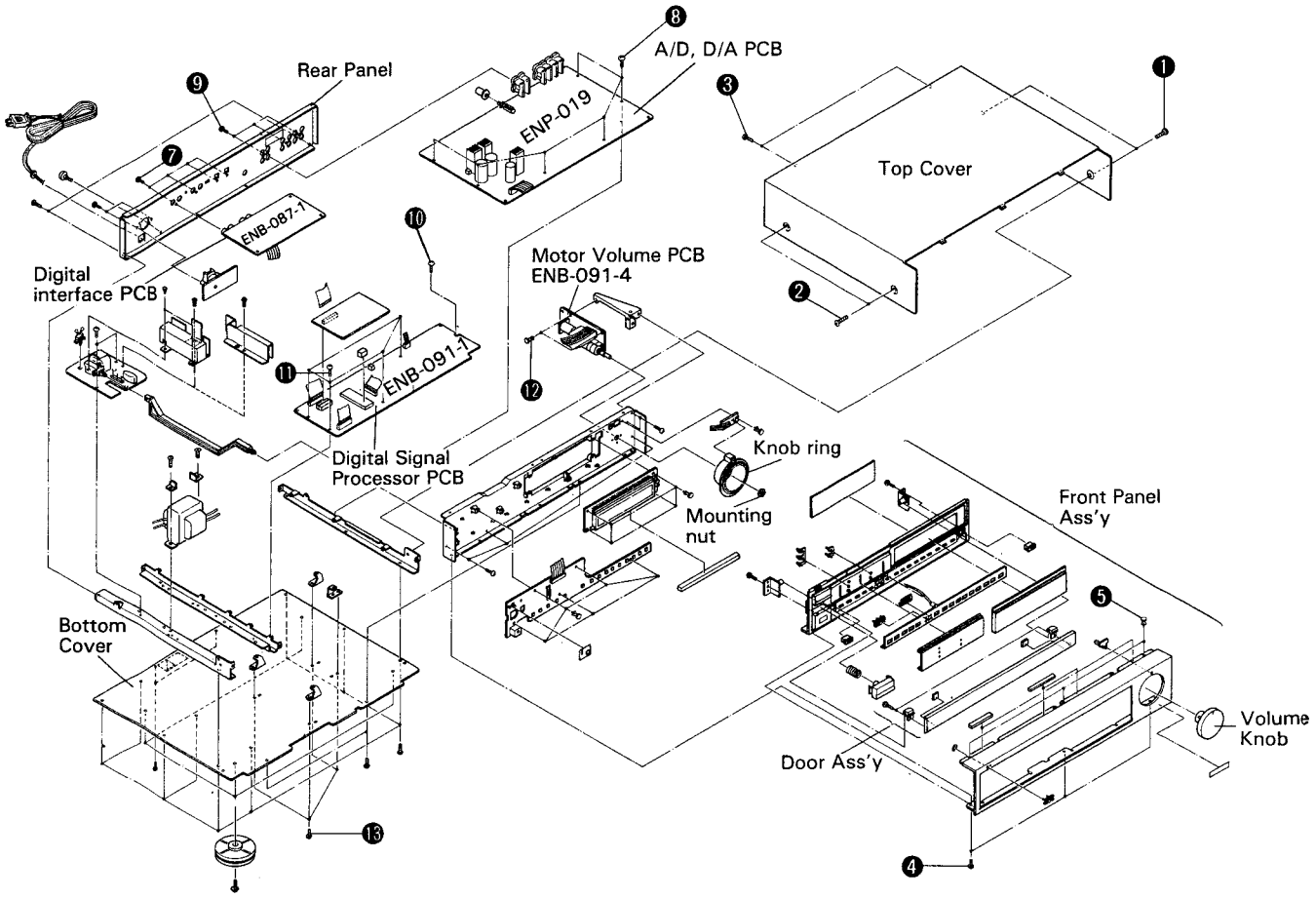
This module is equipped with data write, command write, status read and reset functions. The control lines and functions are:

$\overline{WR}$	$\overline{RD}$	A0	$\overline{CS}$	Function	Direction of data bus
0→1	1	0	0	Data write	Host system→Module
0→1	1	1	0	Command write	Host system→Module
1	0	1	0	Status read	Module→Host system

(5) Reset timing



Removal Procedures



(1) Removing the top cover

1. Remove screws ❶—❸: four screws at both sides and two screws at the rear section of the top cover.
2. While lifting the top cover with its rear bottom open, pull out the top cover.

(2) Removing the front panel ass'y

1. Remove the top cover.
2. Remove three screws ❹ at the bottom side of the panel and three plastic rivets ❺ at the top side.
3. Pull the front panel ass'y.

Note: To remove the door ass'y of the front panel, open the door ass'y at a vertical angle to the panel and pull out the door ass'y.

(3) Removing the digital interface PCB (ENB-087-1)

1. Remove the top cover.
2. Remove four screws ❼ on the rear panel.

(4) Removing A/D, D/A PCB (ENP-019)

1. Remove the top cover and the digital interface PCB.
2. Remove 6 screws ❽ and 3 screws ❾ on the rear panel.

(5) Removing the digital signal processor PCB (ENB-091-1)

1. Remove the top cover.
2. Remove 5 screws ❿ ⓫.

(6) Removing the motor volume PCB (ENB-091-4)

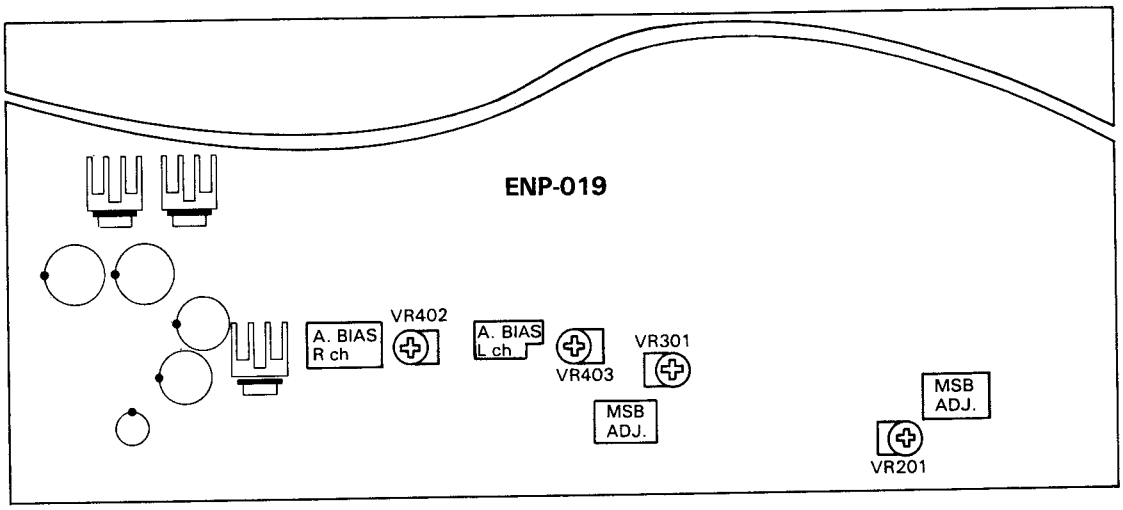
1. Remove the top cover and the front panel assembly.
2. Pull off the volume knob.
3. Remove the mounting nut and the knob ring.
4. Remove the two plastic rivets ⓬ which fix this PCB.

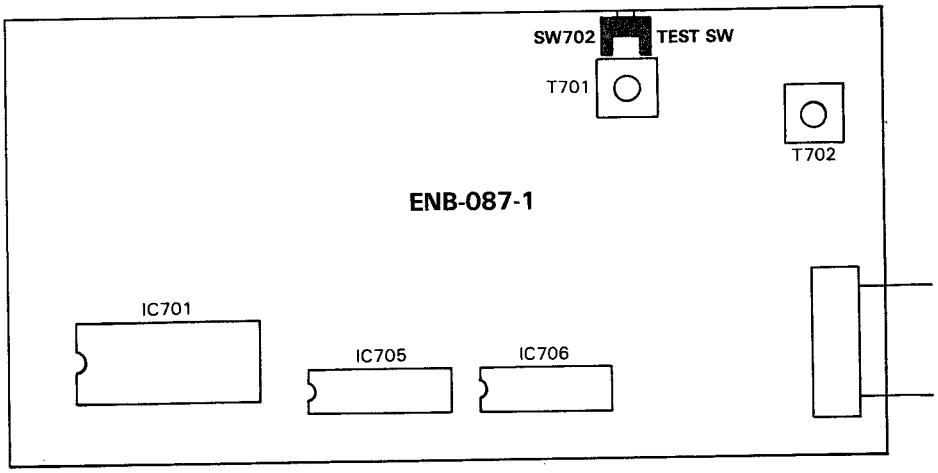
(7) Removing the bottom cover.

1. Remove 17 screws ⓭ which fix the bottom cover.

Adjustment Procedures

■ Adjusting the A/D and D/A PCB (ENP-019)





(1) MSB (distortion factor) adjustment of D/A section

1) Mode setting

Select PROGRAM-1, and press the **TEST switch (SW702)** on the rear panel to set **TEST1 mode**. Then, **turn the DIGITAL DIRECT switch on** and set the master volume at a maximum.

2) Adjusting

After setting, input a digital test signal from the DIGITAL LINE IN, and observe F/DAP or R/DAP at a sampling frequency of **48 kHz** using a distortion factor meter. Adjust **VR201 and VR301** so that the distortion factor will be a minimum.

(Note 1): During the adjustment, set the F/DAP and R/DAP levels to a maximum and turn on the **20 kHz LPF and 400 Hz HPF** of the distortion factor meter. Use a digital signal of **1 kHz and 0 dB** output from a digital audio signal generator or DAT as the test signal.
(Note 2): **MODEL 1506** manufactured by Leader Electronics is a recommended digital audio signal generator.

(2) MSB (distortion factor) adjustment of A/D section

1) Mode setting

Select PROGRAM-1, and press the **TEST switch (SW702)** on the rear panel to set **TEST1 mode**. Then, **turn the digital direct switch off** and set the master volume at a maximum.

2) Adjusting

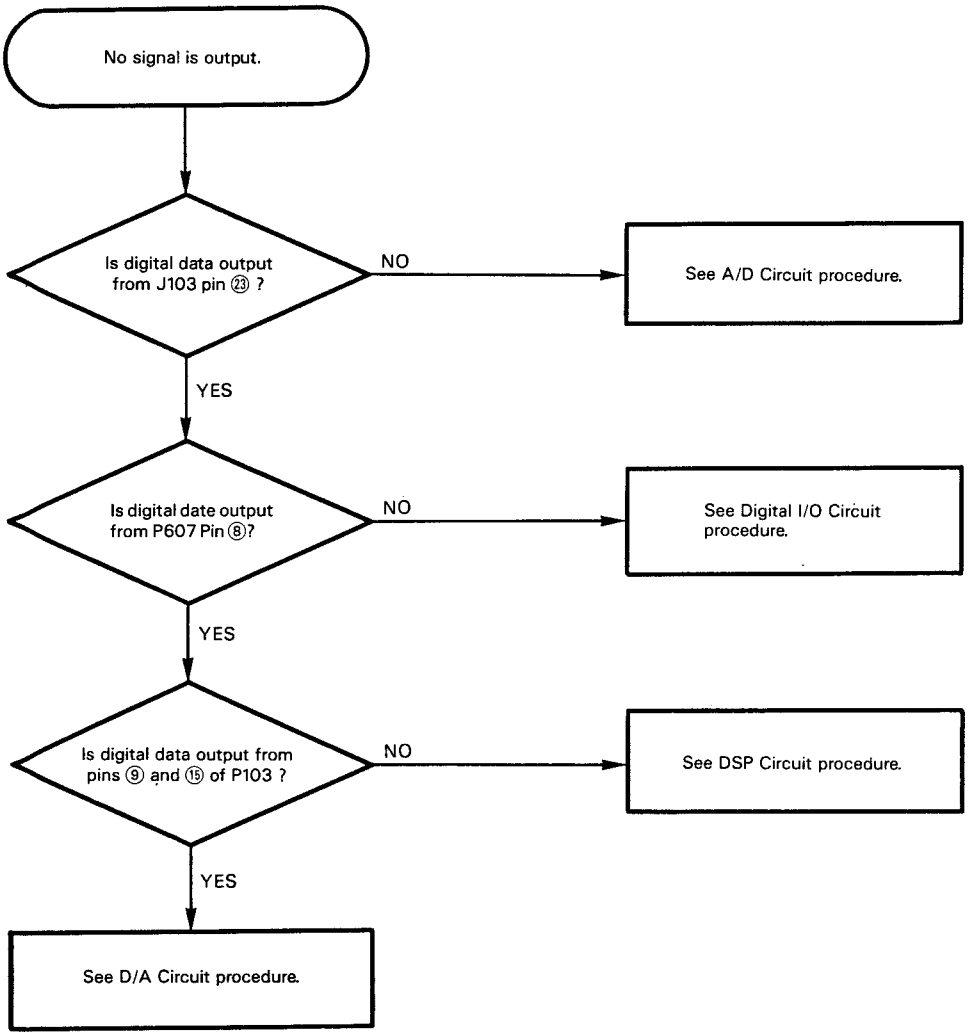
After setting, input a test signal of **1 kHz and -3 dBm** from an analog signal generator to the analog LINE IN, and observe the R/DAP output using the distortion factor meter. Adjust **VR402 and VR403** so that the L-ch and R-ch distortion factors will be a minimum.

(Note): During adjustment, set the INPUT, F/DAP and R/DAP levels to a maximum.

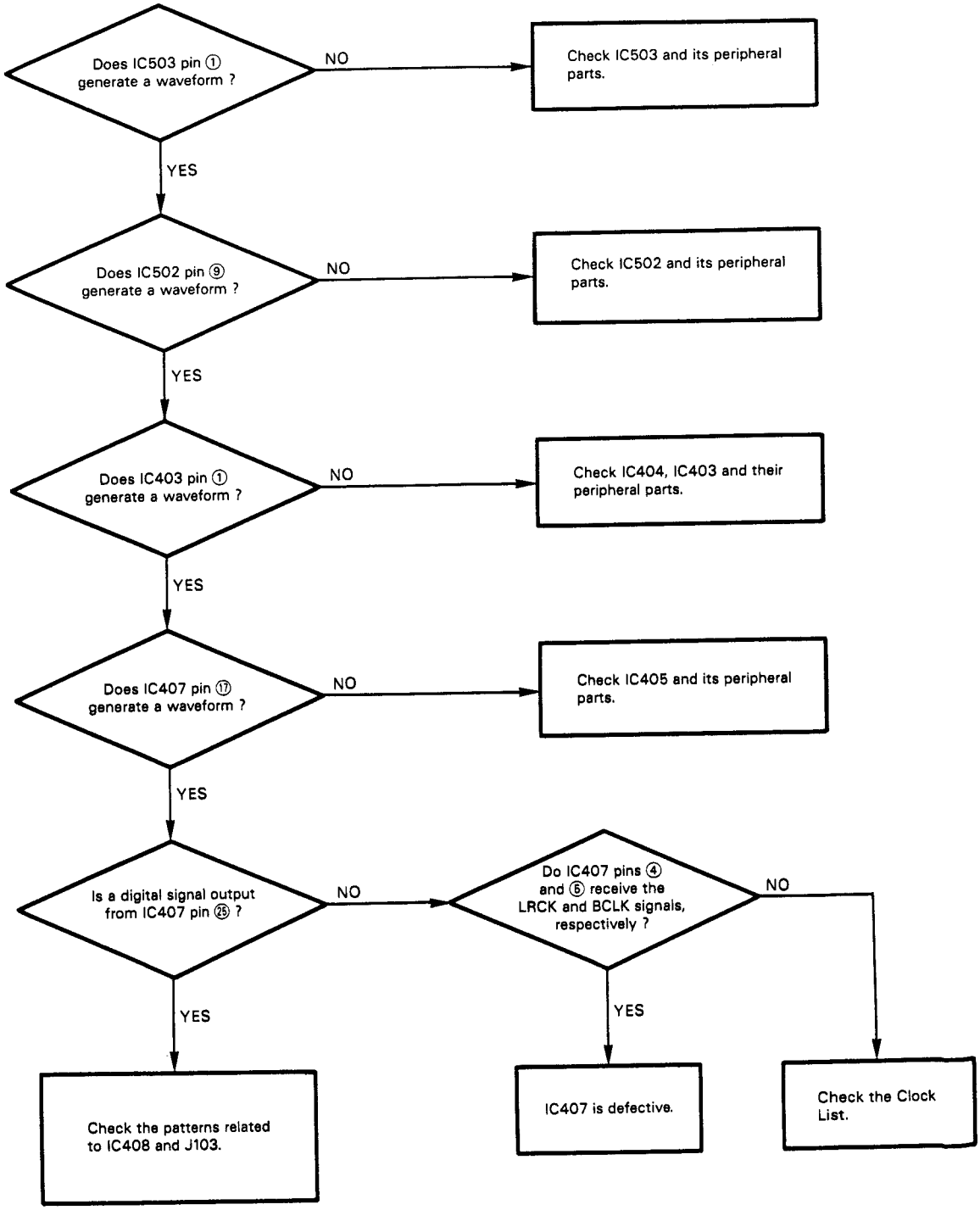
Troubleshooting

If no signal is output, first perform the following operations (1) to (3):

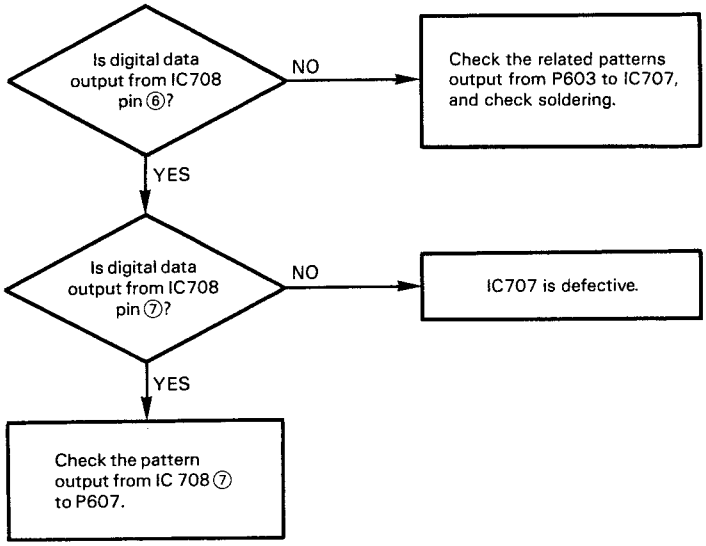
(1) Input a 1 kHz and − 3 dB sine wave to analog LINE IN.
(2) Turn the DIGITAL DIRECT MODE, TAPE MONITOR, and DAP RECORDING off.
(3) Set the MASTER VOLUME to maximum.


No signal is output.
Is digital data output from J103 pin ㉓ ?
NO
See A/D Circuit procedure.
YES
Is digital date output from P607 Pin ⑧?
NO
See Digital I/O Circuit procedure.
YES
Is digital data output from pins ⑨ and ⑮ of P103 ?
NO
See DSP Circuit procedure.
YES
See D/A Circuit procedure.

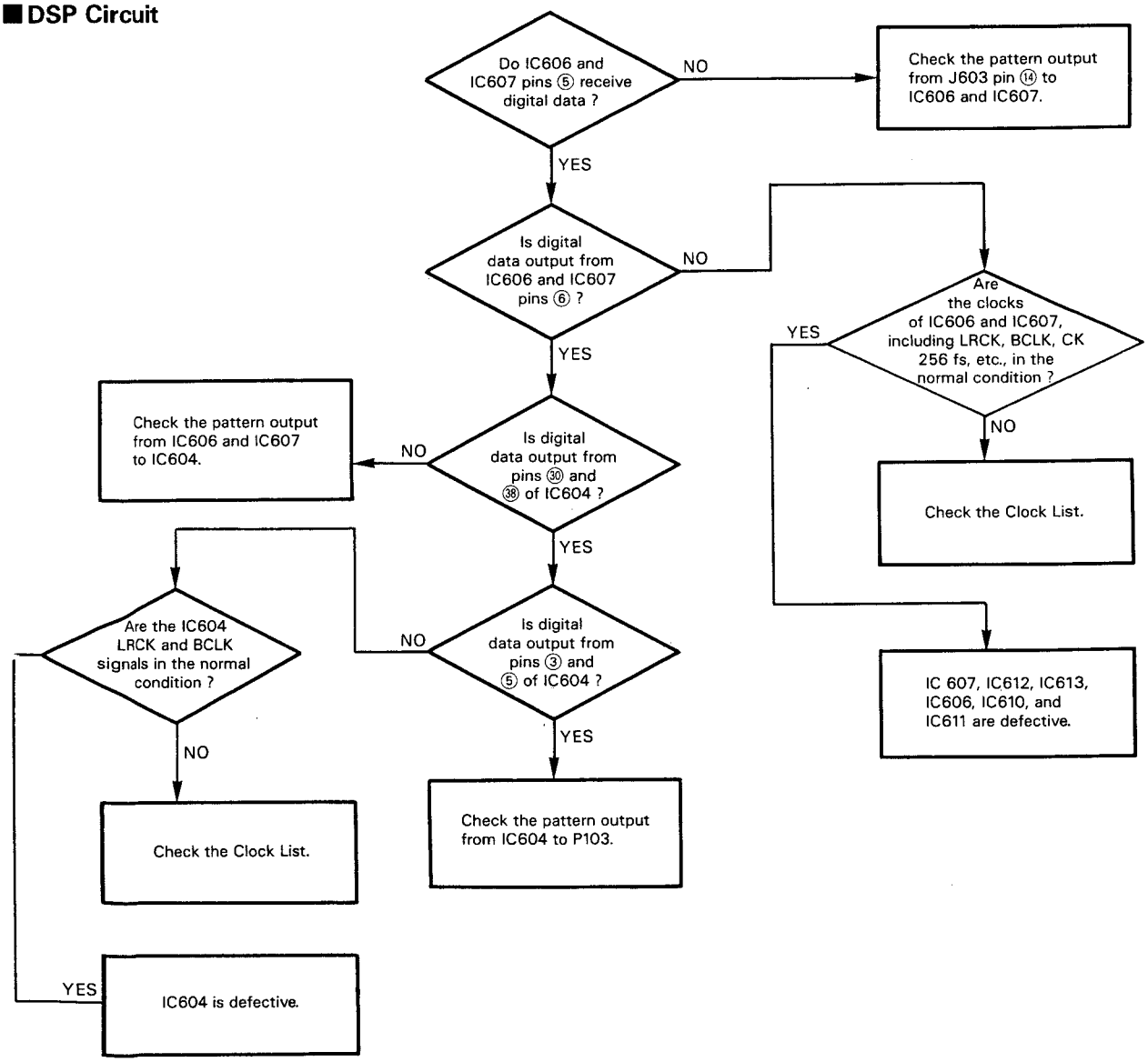
■ A/D Circuit


Does IC503 pin ① generate a waveform ?
NO
Check IC503 and its peripheral parts.
YES
Does IC502 pin ⑨ generate a waveform ?
NO
Check IC502 and its peripheral parts.
YES
Does IC403 pin ① generate a waveform ?
NO
Check IC404, IC403 and their peripheral parts.
YES
Does IC407 pin ⑰ generate a waveform ?
NO
Check IC405 and its peripheral parts.
YES
Is a digital signal output from IC407 pin ㉕ ?
NO
Do IC407 pins ④ and ⑤ receive the LRCK and BCLK signals, respectively ?
NO
YES
YES
Check the patterns related to IC408 and J103.
IC407 is defective.
Check the Clock List.

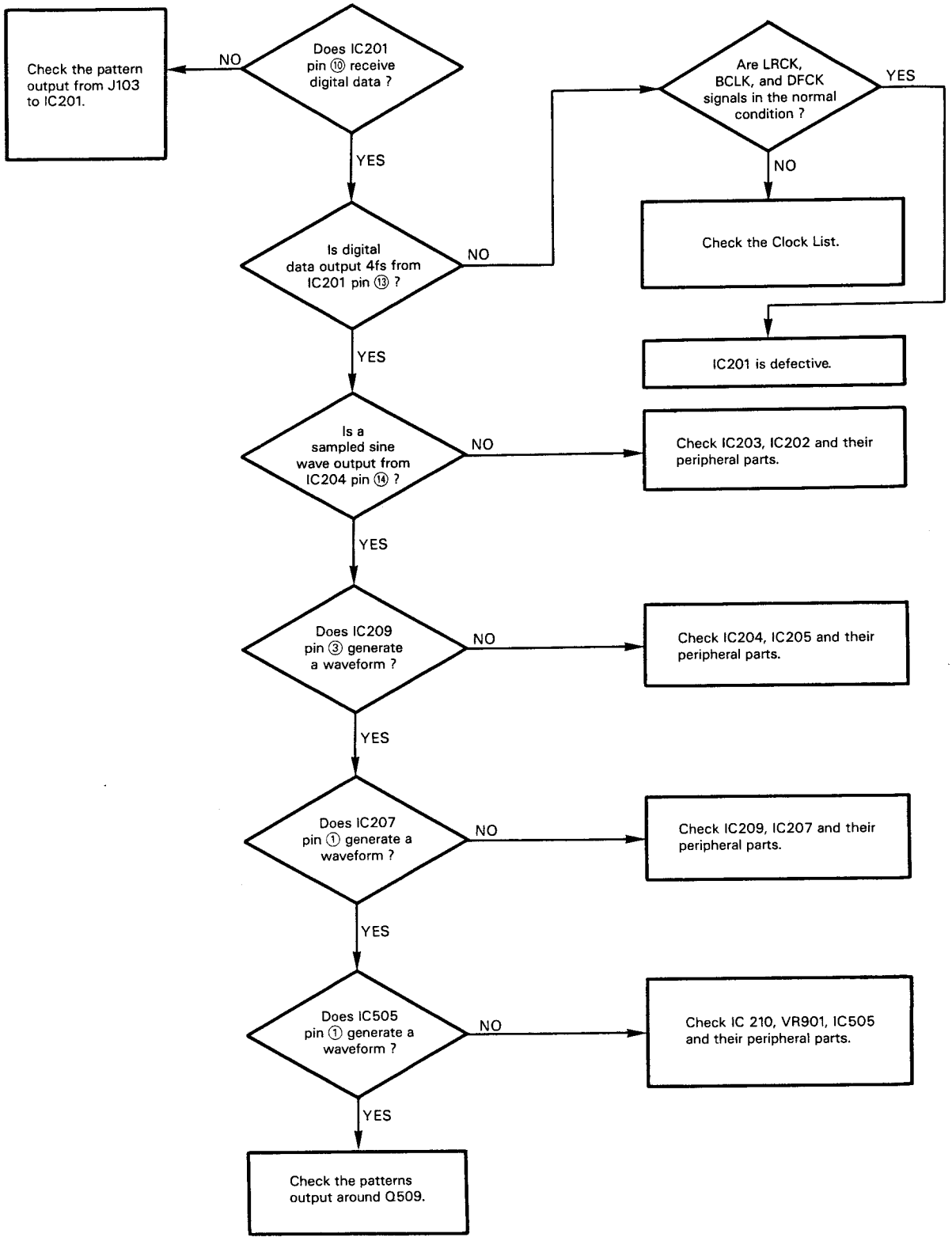
■ Digital I/O Circuit


Is digital data output from IC708 pin ⑥?
NO
Check the related patterns output from P603 to IC707, and check soldering.
YES
Is digital data output from IC708 pin ⑦?
NO
IC707 is defective.
YES
Check the pattern output from IC 708 ⑦ to P607.

■ DSP Circuit


Do IC606 and IC607 pins ⑤ receive digital data ?
NO
Check the pattern output from J603 pin ⑭ to IC606 and IC607.
YES
Is digital data output from IC606 and IC607 pins ⑥ ?
NO
Are the clocks of IC606 and IC607, including LRCK, BCLK, CK 256 fs, etc., in the normal condition ?
YES
NO
Check the Clock List.
YES
Check the pattern output from IC606 and IC607 to IC604.
NO
Is digital data output from pins ㉚ and ㊳ of IC604 ?
YES
Are the IC604 LRCK and BCLK signals in the normal condition ?
NO
Is digital data output from pins ③ and ⑤ of IC604 ?
NO
IC 607, IC612, IC613, IC606, IC610, and IC611 are defective.
NO
YES
Check the Clock List.
YES
Check the pattern output from IC604 to P103.
YES
IC604 is defective.

■ D/A Circuit: Described for F/DAP only.


Check the pattern output from J103 to IC201.
NO
Does IC201 pin ⑩ receive digital data ?
YES
Are LRCK, BCLK, and DFCK signals in the normal condition ?
YES
NO
Check the Clock List.
Is digital data output 4fs from IC201 pin ⑬ ?
NO
YES
IC201 is defective.
Is a sampled sine wave output from IC204 pin ⑭ ?
NO
Check IC203, IC202 and their peripheral parts.
YES
Does IC209 pin ③ generate a waveform ?
NO
Check IC204, IC205 and their peripheral parts.
YES
Does IC207 pin ① generate a waveform ?
NO
Check IC209, IC207 and their peripheral parts.
YES
Does IC505 pin ① generate a waveform ?
NO
Check IC 210, VR901, IC505 and their peripheral parts.
YES
Check the patterns output around Q509.

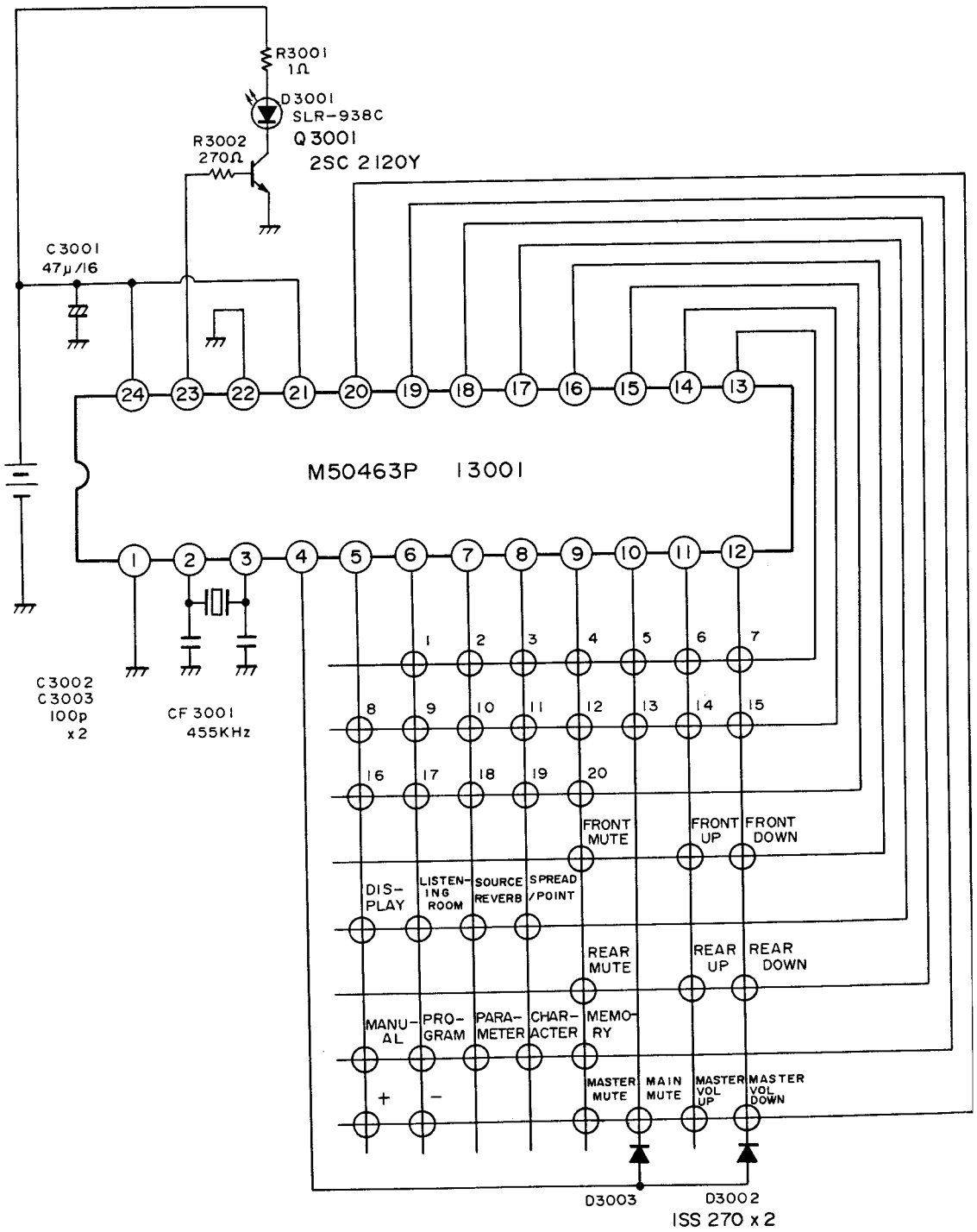
■ Clock List

Check the clock signal of each terminal listed in the table below. If there is any defect, check the related parts or patterns. (fs=48 kHz)

	Multiple of fs	Frequency	Cycle	Terminal
1.	512 fs (A/D) [Name; X'tal 512 fs]	24.576 MHz	40.69 nS	IC408 ⑪, ⑨, ⑧, ②, ④ IC406, 407 ⑧ IC602 ⑪
2.	256 fs (DSP, Digital filter) [Name; CK256 fs X'tal 256 fs]	12.288 MHz	81.38 nS	IC602 ⑨ IC605, 606, 607 ② IC708 ⑩, ⑪, ⑫, ⑬, ⑭ IC709 ⑧
3.	64 fs (DIR, DSP in digital direct mode) [Name; BCLK BCLK1 64 fs]	3.072 MHz	325.5 nS	IC701 ⑫ (in digital mode) IC708 ③, ④ (in digital mode) IC 605, 606 ⑭ (in digital mode)
4.	32 fs (A/D, DSP, ADDER digital filter) [Name; BCLK BCLK 32 fs]	1.536 MHz	651.0 nS	IC406, 407 ⑤ IC605, 606, 607 ⑭, ⑮ IC604 ⑦, ㉖, ㉞ IC201, 301 ⑪ IC707 ⑤, IC708 ②, ④
5.	1 fs (LR clock) (A/D, DSP, ADDER, digital filter) [Name; LRCK LRCK1]	48 kHz	20.83 μS	IC406, 407 ④ IC605, 606, 607 ⑰, ⑱ IC604 ㉜ IC201, 301 ⑨ IC707 ⑧ IC712 ⑧, ⑨, ⑩, ⑪ IC701 ⑮

Remote Control Unit ⟨RM-SXA1010U⟩

■ Schematic Diagram



■ Disassembly

(1) Remove the screw in the middle of the backside of the remote control unit.
(2) Slide the bottom panel downwards to take it off.

Precautions for Connecting Your JVC Amplifier

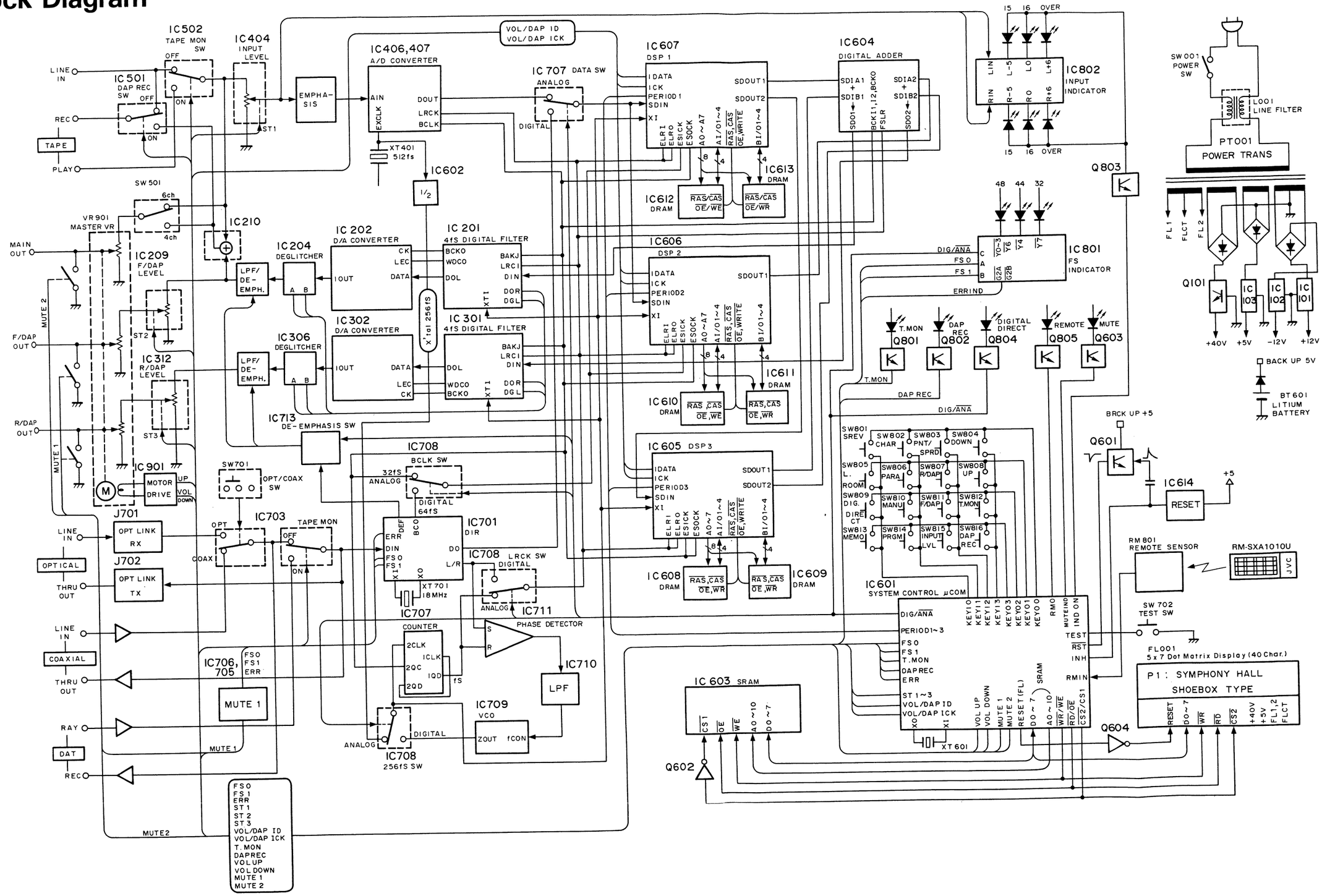
When using your equipment together with JVC amplifier AX-Z1010TN, AX-Z911BK or AX-Z711BK, please set the switches as described in the table below.

(In regard to connection methods, please refer to page 11 in the Instruction Book.)

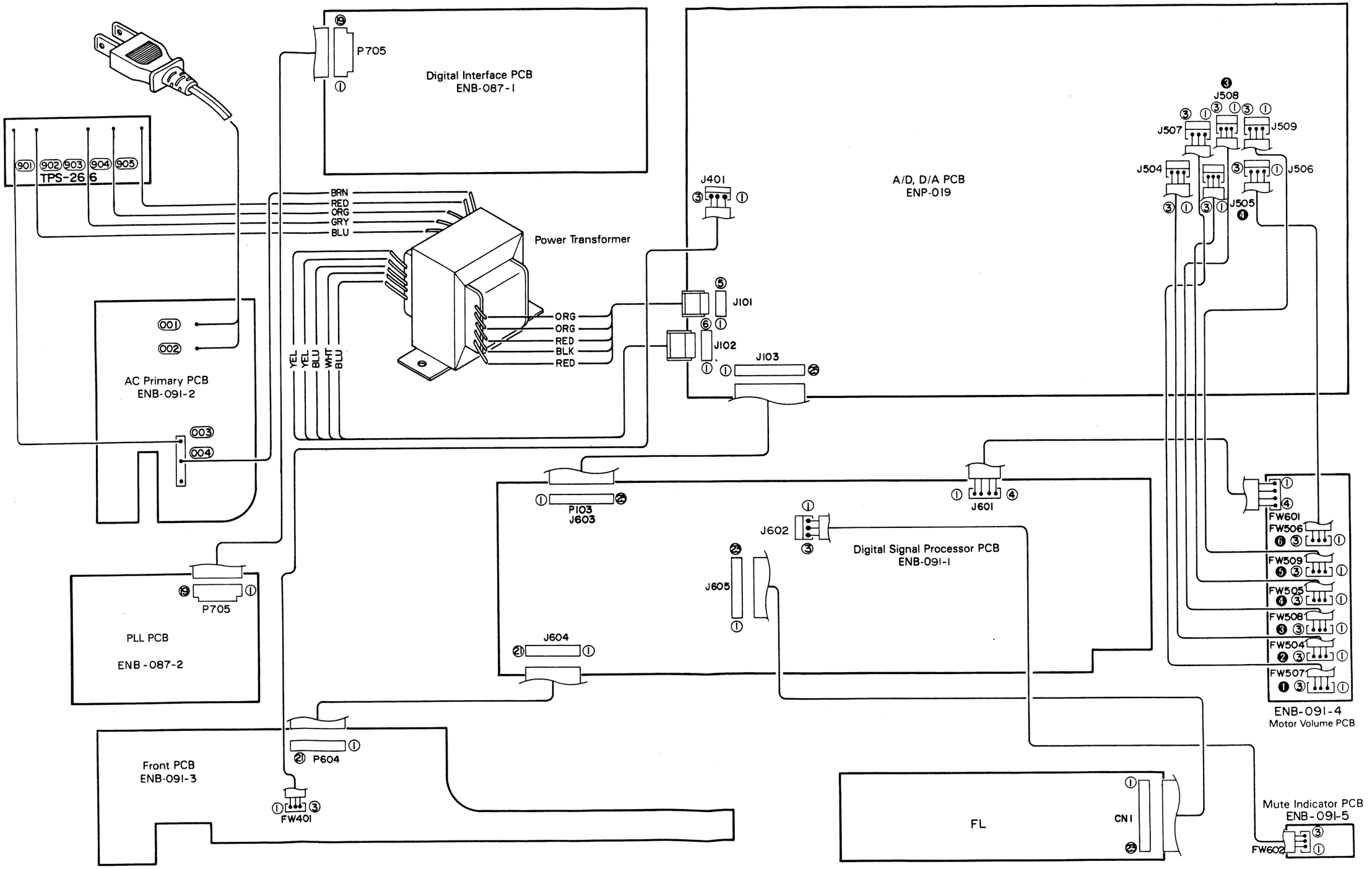
MODEL	AMP SOURCE SELECTION	AMP DAT MONITOR SW	AMP TAPE MONITOR SW	MAIN UNIT DIGITAL DIRECT SW	MAIN UNIT OFFS DELAY VALUE
AX-Z1010TN	DIGITAL	ON	ON	ON	10m Sec
	ANALOG	OFF	ON	OFF	0m Sec
AX-Z911BK	DIGITAL	ON	ON	ON	48kHz / 44.1kHz / 32kHz 140m Sec / 150m Sec / 200m Sec
	ANALOG	ON or OFF	ON	OFF	0m Sec
AX-Z711BK	DIGITAL	ON	OFF	ON*	0m Sec
	ANALOG	OFF	ON	OFF	0m Sec

*In this case, main level cannot be controlled by master volume.

Block Diagram

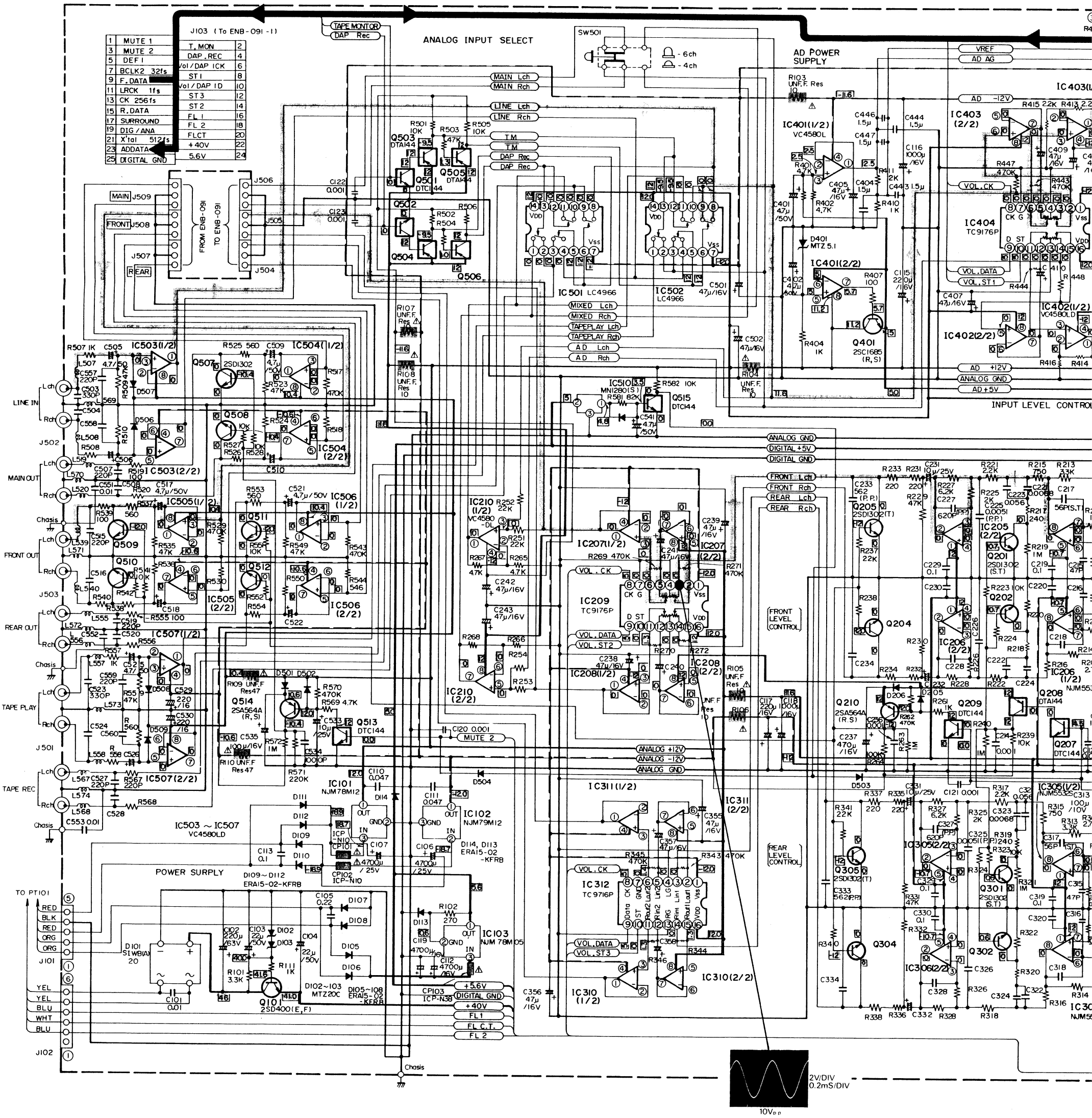


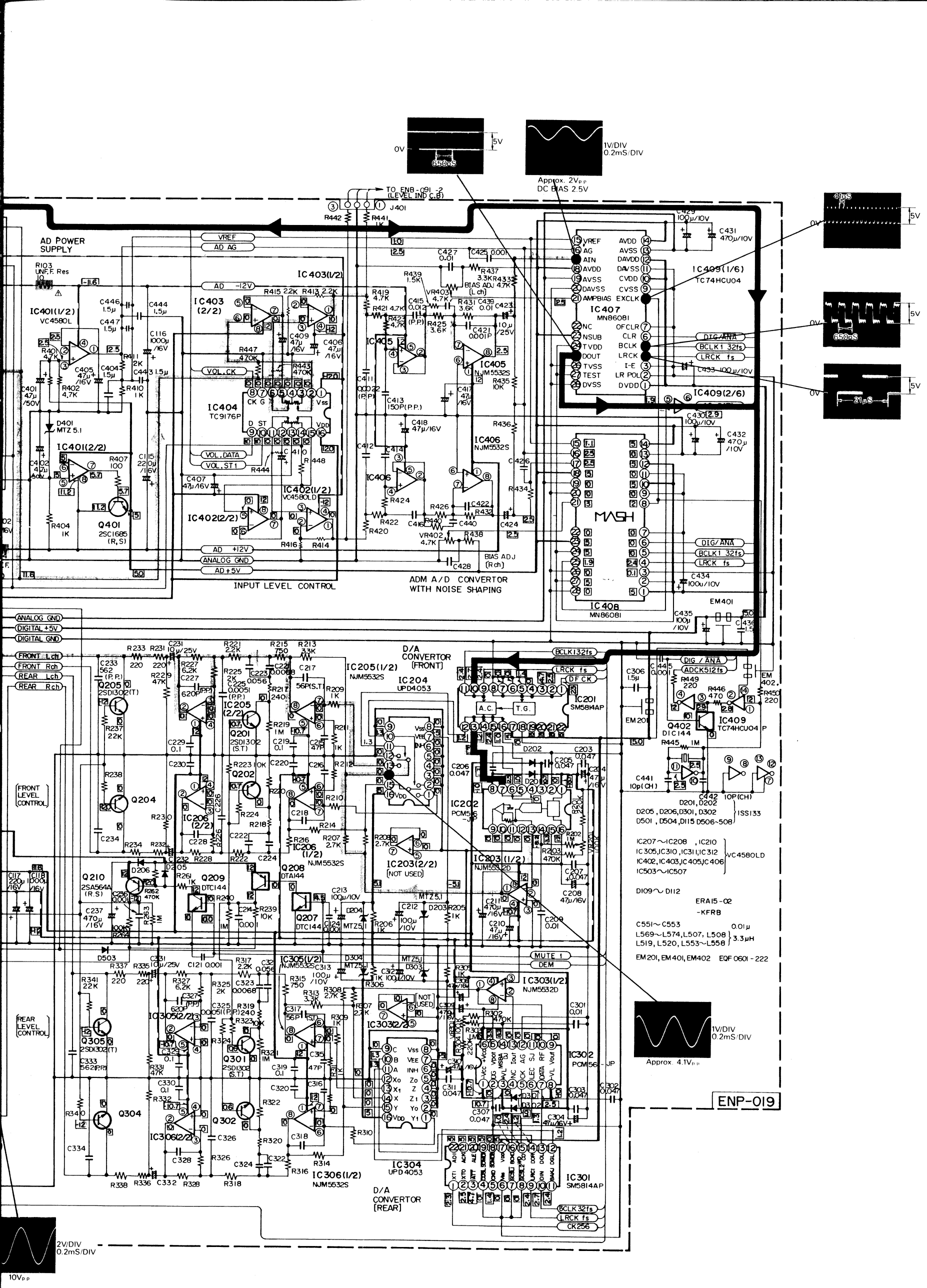
Connection Diagram

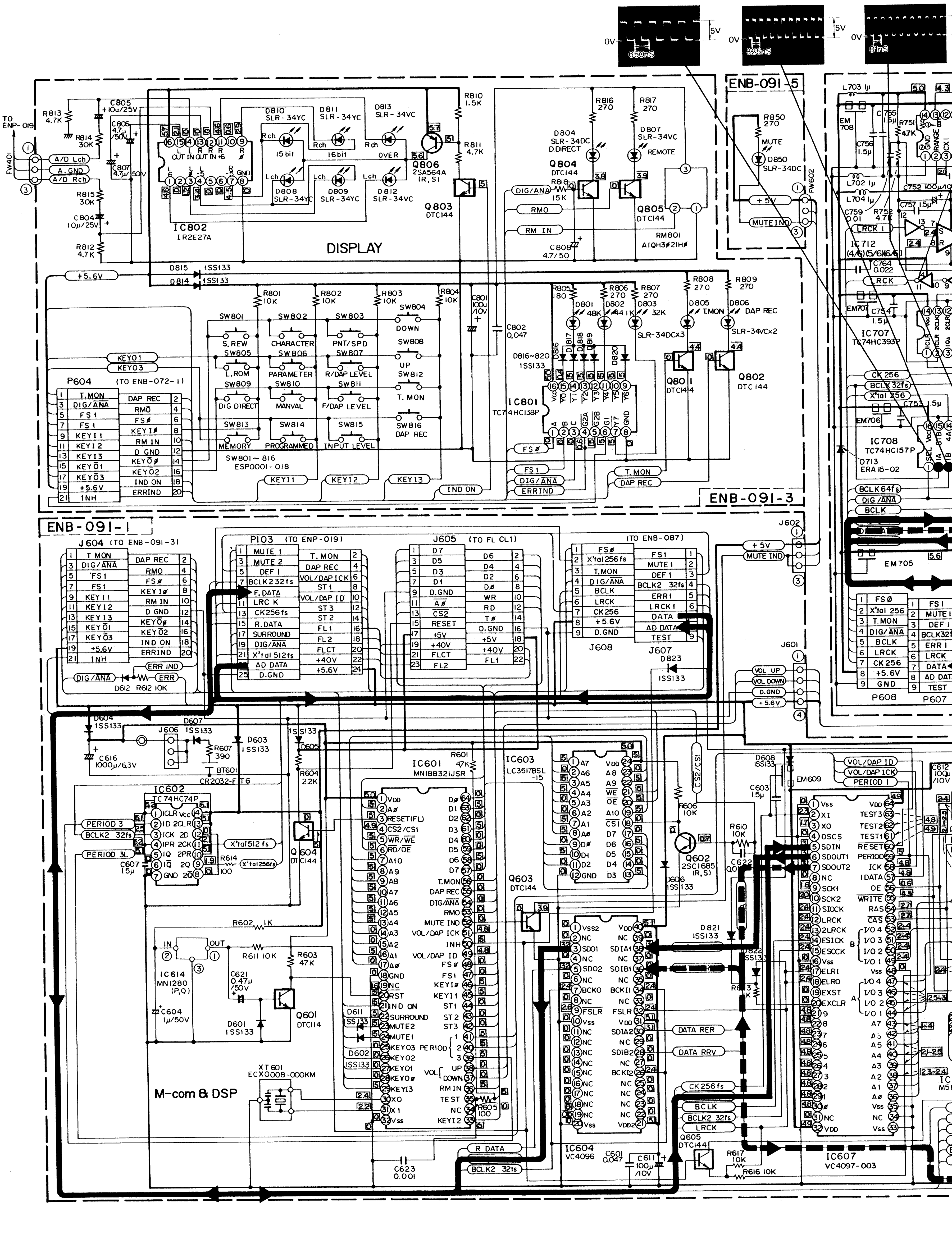


(No. 20120)

Schematic Diagram




AD POWER SUPPLY
IC401(1/2) VC4580L
IC401(2/2)
IC403(1/2)
IC403 (2/2)
IC404 TC9176P
IC402(1/2) VC4580LD
IC402(2/2)
IC405 NJM5532S
IC406 NJM5532S
IC407 MN86081
IC408 MN86081
IC409(1/6) TC74HCU04
IC409(2/6)
Q401 2SC1685 (R,S)
D401 MTZ5.1
VREF
AD AG
AD -12V
VOL.CK
VOL.DATA
VOL.ST1
AD +12V
ANALOG GND
AD +5V
INPUT LEVEL CONTROL
ADM A/D CONVERTOR WITH NOISE SHAPING
TO ENB-091 -2 (LEVEL IND C.B)
J401
0V
5V
650nS
1V/DIV 0.2mS/DIV
Approx. 2Vp-p DC BIAS 2.5V
41μS
21μS
DIG/ANA
BCLK1 32fs
LRCK fs
ANALOG GND
DIGITAL +5V
DIGITAL GND
FRONT Lch
FRONT Rch
REAR Lch
REAR Rch
FRONT LEVEL CONTROL
REAR LEVEL CONTROL
D/A CONVERTOR (FRONT)
D/A CONVERTOR (REAR)
IC205(1/2) NJM5532S
IC204 UPD4053
IC205(2/2)
IC206(2/2)
IC206(1/2) NJM5532S
IC203(2/2) (NOT USED)
IC202 PCM56-JP
IC203(1/2) NJM5532D
IC201 SM5814AP
IC303(2/2)
IC303(1/2) NJM5532D
IC305(1/2) NJM5532S
IC305(2/2)
IC306(2/2)
IC306(1/2) NJM5532S
IC304 UPD4053
IC301 SM5814AP
IC302 PCM56-JP
Q205 2SD1302(T)
Q201 2SD1302 (S.T)
Q204
Q202
Q210 2SA564A (R.S)
Q209 DTC144
Q207 DTC144
Q208 DTA144
Q305 2SD1302(T)
Q301 2SD1302 (S.T)
Q304
Q302
BCLK132fs
LRCK fs
DFCK
DIG/ANA
ADCK512fs
MUTE 1
DEM
BCLK 32fs
LRCK fs
CK256
D205, D206, D301, D302 D501, D504, D115 D506~508 } 1SS133
IC207~IC208, IC210 IC305, IC310, IC311, IC312 IC402, IC403, IC405, IC406 IC503~IC507 } VC4580LD
D109~D112 ERA15-02 -KFR8
C551~C553 L569~L574, L507, L508 L519, L520, L553~L558 } 0.01μ 3.3μH
EM201, EM401, EM402 EQF0601-222
1V/DIV 0.2mS/DIV
Approx. 4.1Vp-p
2V/DIV 0.2mS/DIV
10Vp-p
ENP-019



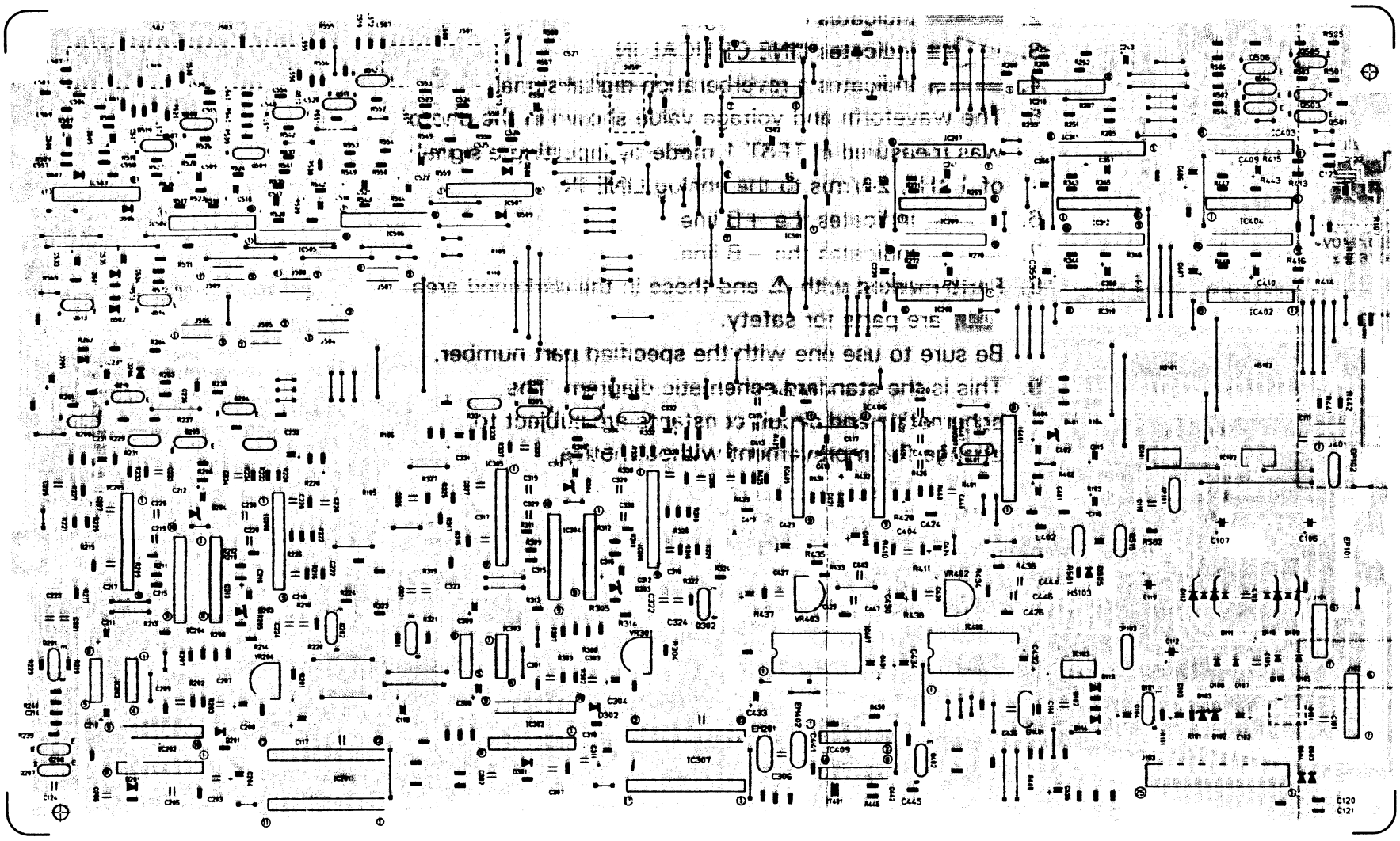
650nS
325nS
81nS
5V
0V
DISPLAY
IC802
IR2E27A
Q806
2SA564A (R, S)
Q803
DTC144
Q804
DTC144
Q805
DTC144
RM801
A1QH3Ø21HØ
ENB-091-5
FW602
FW401
TO ENP-019
A/D Lch
A. GND
A/D Rch
+5.6V
IC801
TC74HC138P
Q801
DTC144
Q802
DTC144
SW801~816
ESP0001-018
P604 (TO ENB-072-1)
ENB-091-3
ENB-091-1
J604 (TO ENB-091-3)
P103 (TO ENP-019)
J605 (TO FL CL1)
(TO ENB-087)
J608
J607
J602
J601
IC707
TC74HC393P
IC708
TC74HC157P
IC712
EM705
P608
P607
IC601
MN18832IJSR
IC602
TC74HC74P
IC603
LC3517BSL-15
IC604
VC4096
IC607
VC4097-003
IC614
MN1280 (P,Q)
Q601
DTC114
Q602
2SC1685 (R, S)
Q603
DTC144
Q604
DTC144
Q605
DTC144
XT601
ECX0008-000KM
M-com & DSP

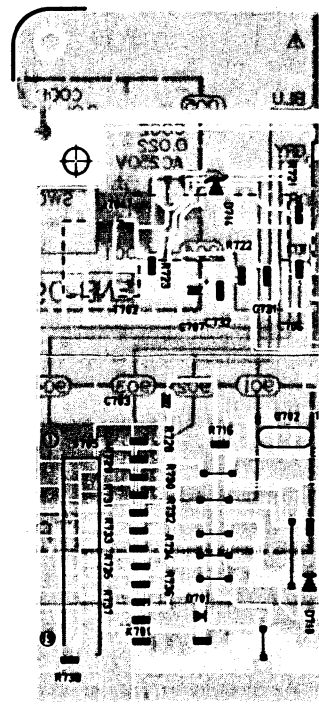
5V
0V
21μS
5V
0V
650nS
5V
DIGITAL I/O
IC709
SN74LS624
R751
47K
C752 100μ/10V
C761 22P(CH)
R757 470K
C758 0.022
C757 1.5μ
IC711
TC5081AP
R758 18K
R754 2.7K
C762 1μ(N.P.)
C763 0.01
R756 470
R753 2.2K
C760 0.01
R755 1K
IC710 NJM3404S
IC712(1/6)(2/6)
TC74HC04P
L705 1μ
C765 33P
C753 1.5μ
PLL
IC712 (3/6)
ENB-087-2
EM705
EM705~708 EQF0601~222
P705
P607
FS I
MUTE I
DEF I
BCLK32fs
ERR I
LRCK
DATA
AD DATA
TEST
FSØ
N.C.
T.MON
DIG/ANA
BCLK64fs
N.C.
N.C.
+5.6V
GND
DIG DATA
+5.6V
GND
C713 1.5μ EM704
T. MON
IC703(1/6)
C702 100μ/10V
EM701
C710 1.5μ
R703 47K
SW701
R702 47K
OPT
COAX
L701
C701 100μ/10V
J701
TORX 174
IN
LINE (OPT)
C715 1.5μ
IC702
TC74HC125P
J702
TOTX 174
OUT
R701 8.2K
EM701~704
EQF0601-222
IC704(1/6)
C721 0.01
C722 470P
R704 270
C723 33P
C724
XT701 18M
R705 1M
D702
D703
Q701 DTC144
Q702 DTC144
R716 10K
D710
BCLK164fs
DIG/ANA
C709 10μ/16V
R717 47K
IC701 YM3623B
VDD
ADJ
VCO
Vss2
XO
X1
KMOOD
ØA
ØB
T1
T2
BCO
SYNC
Vss1
DIN
SDO
SSYNC
SCK
S2
S1
SEL
ERR
DIGL
DIGR
WC
DO
DEF
L/R
FS I
FSØ
ERR
DEF
LRCK I
R713 10K
IC706(2/2)
D712
D708
R741 10K
R714 10K
R722 100
R723 100
C725 726 15P
IC705
TC74HC86P
D704~D706
MUTE I
ERR I
DIG/ANA
IC706(1/2)
TC74HC123P
D702~712
ISS133
R728~R738 220
C714 0.1
C712 1.5μ
EM702
EM703
D707
D708
C711 1.5μ
DEF
K701
D701
ERA15-02
IC703(2/6)
TC74HC04P
IC704 (1/6)
TC74HC004P
C708 100μ/10V
SW702 TEST
J705
R729
R730
R732
R735
R737
R738
ENB-087-1
IC703(3/6)(4/6)
C704 47μ/25V
IN
R706 4.7K
C721 0.01
R707 18K
R708 2.2K
J703
LINE (COAX)
C705 47μ/25V
D713 R718 MTZ5.1 75
R720 10
C728 0.01
OUT
R719 75
C729 33P
T701
R722 10
R721 75
REC
IC703(5/6)(6/6)
C707 47μ/25V
C732 0.01
C731 33P
T702
C706 47μ/25V
J704
DAT (COAX)
C730 0.01
PLAY
IC704(5/6)(6/6)
R710 18K
R709 4.7K
D714 MTZ 5.1
R723 75
R711 2.2K
C901 100μ/6.3V
FW601
VOL UP
VOL DOWN
D GND
+5.6V
VR901
IC901
LB1639-C
ENB-091-4
ML OUT
A.GND
MR OUT
ML IN
A.GND
MR IN
FL OUT
A.GND
FR OUT
FL IN
A.GND
FR IN
RL OUT
A.GND
RR OUT
RL IN
A.GND
RR IN
FW507
FW504
FW508
FW505
FW509
FW506
TO ENP-010
EM601
D610 ISS133
R609 10K
D609 ISS133
VOL/DAP ID
VOL/DAPICK
PERIOD2
EM608
C612 100μ/10V
C602 1.5μ
C613 100μ/10V
C605 1.5μ
EM603
EM607
VOL/DAP ID
VOL/DAPICK
PERIOD3L
C614 100μ/6.3V
C608 1.5μ
EM605
IC608
M5M4464P-12
IC612
M5M4464P-12
IC610
M5M4464P-12
IC611
M5M4464P-12
IC613
M5M4464P-12
IC609
M5M4464P-12
EM606
C809 1.5μ
C810 1.5μ
EM604
EM602
IC606
VC4097-003
IC605
VC4097-002
EM601~609
EQF0601-222
DATA RER
CK 256 fs
DATA
BCLK
BCLK2 32fs
LRCK
DATA RRV
CK 256 fs
BCLK2 32fs
LRCK

Printed Circuit Board Ass'y

■ DIGITAL INTE

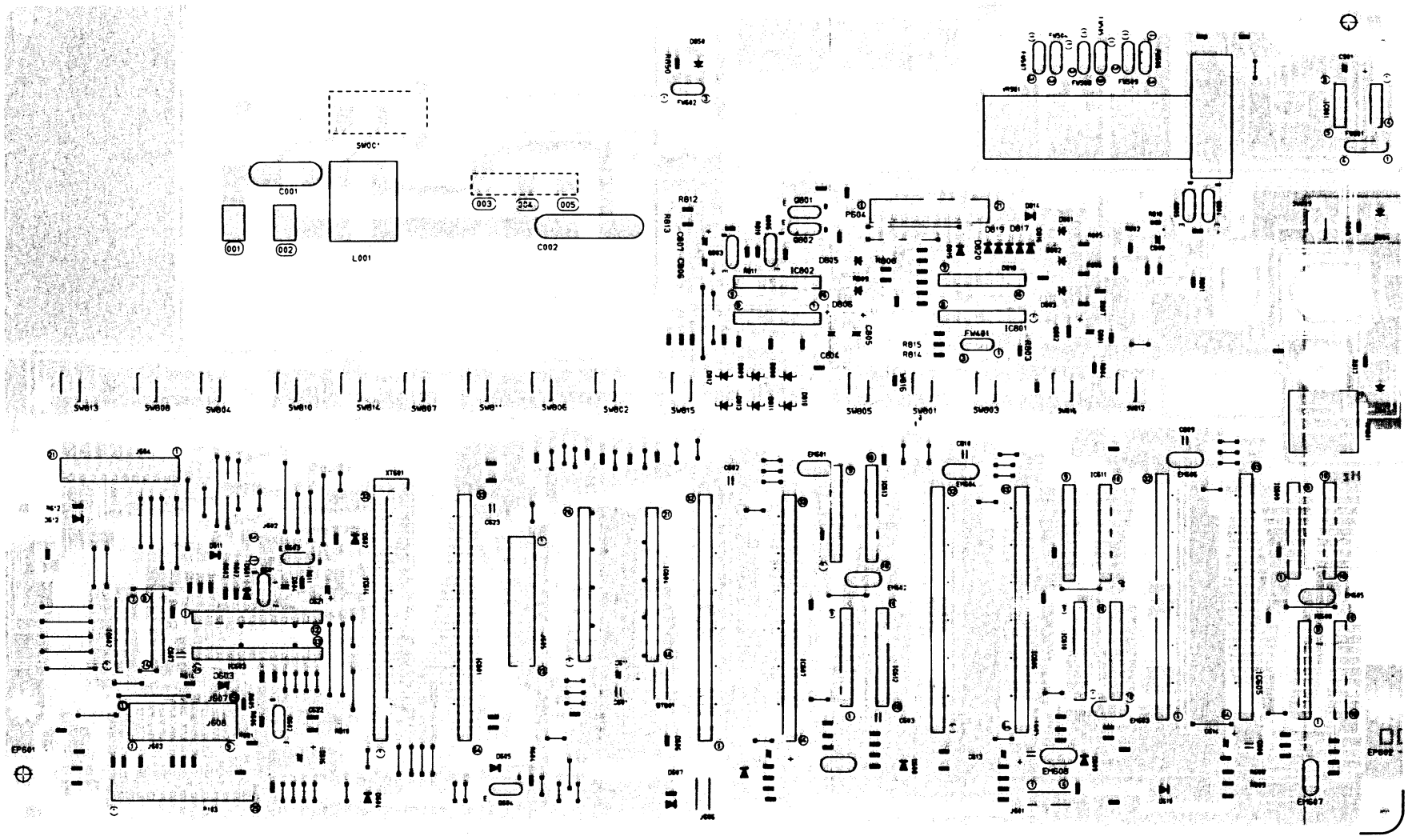
■ A/D, D/A P.C. BOARD (ENP-019)





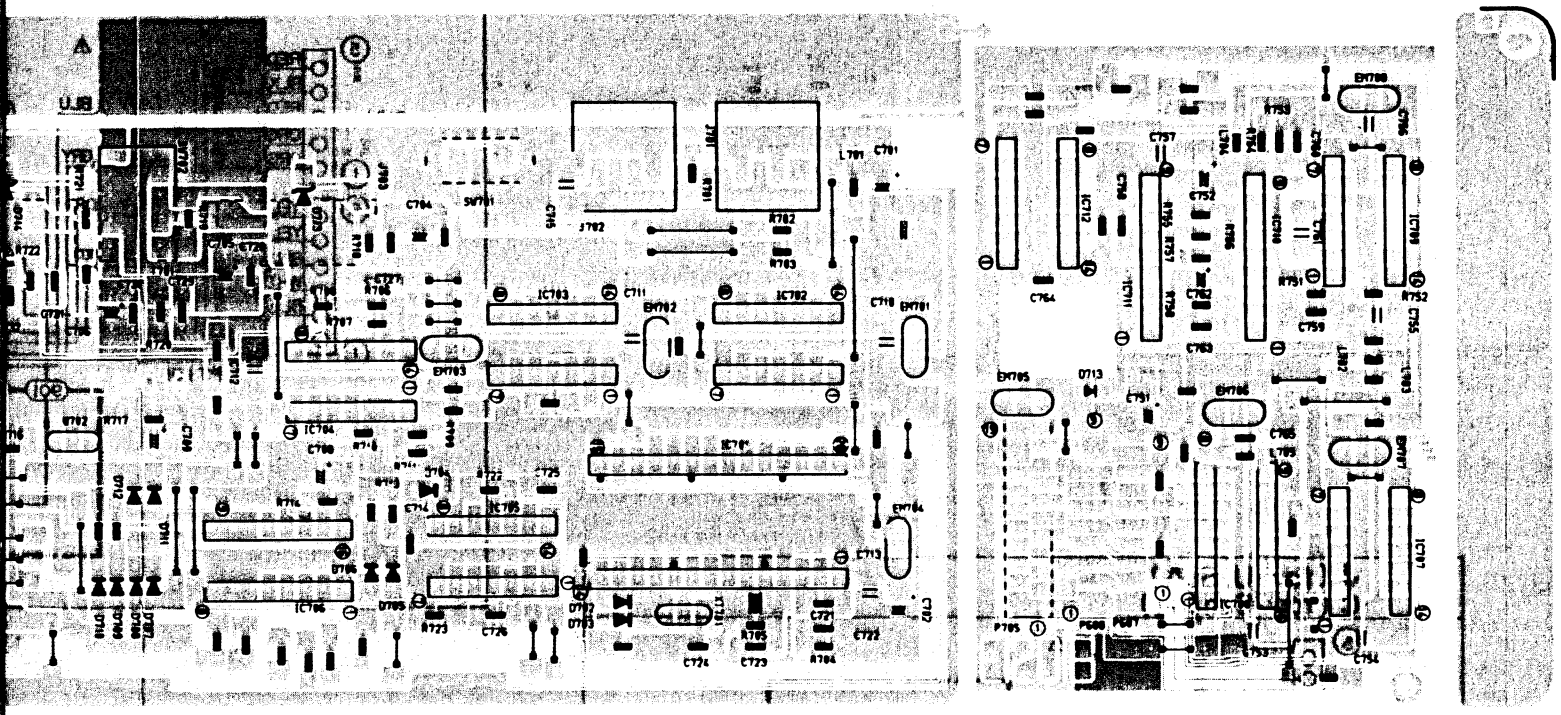
■ VOLTAGE SEL

■ DIGITAL SIGNAL PROCESSOR P.C. BOARD etc. (ENB-091)

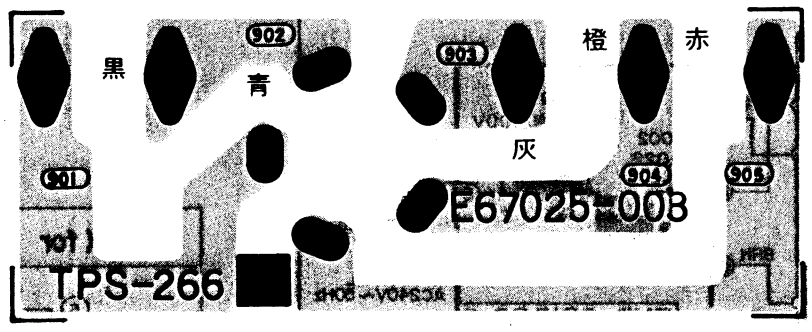


(No.20120)

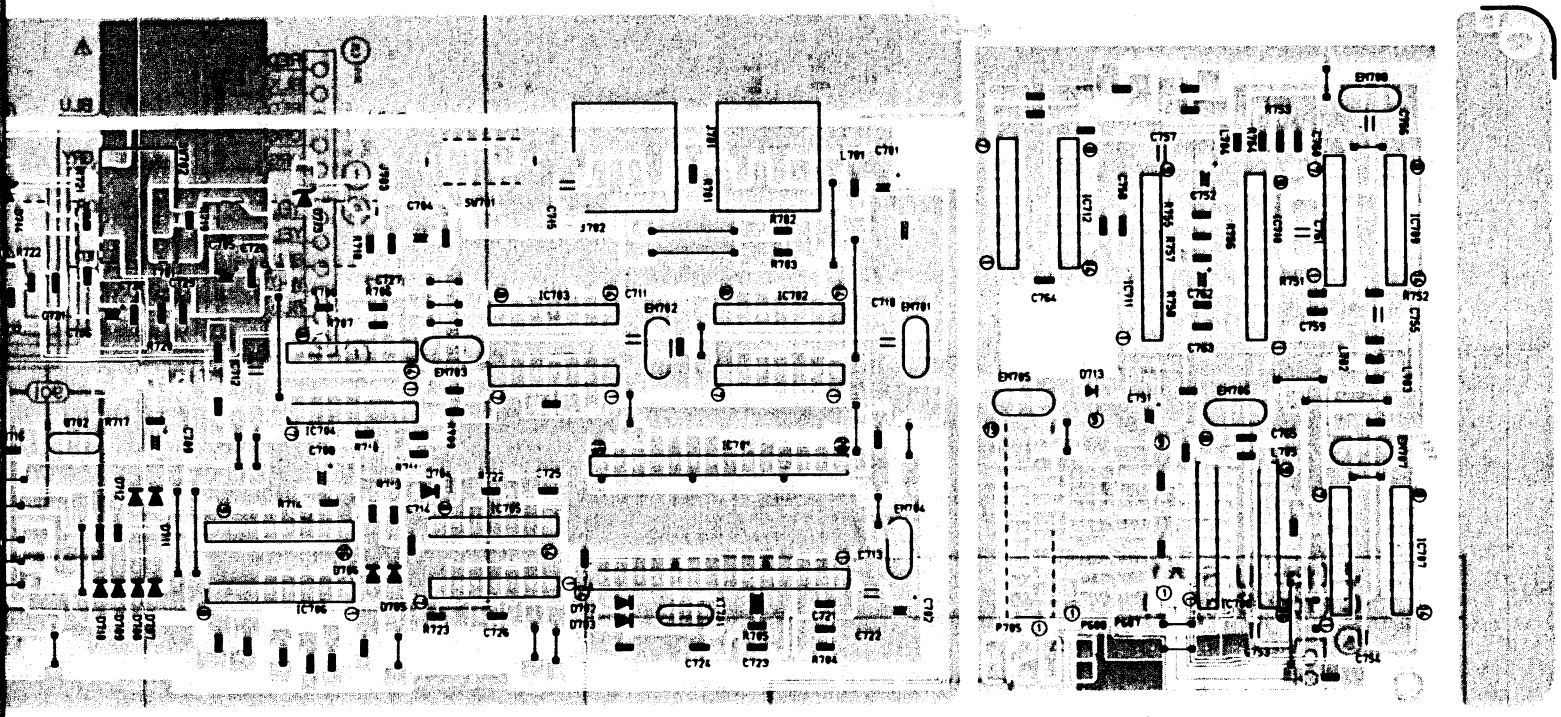
AL INTERFACE P.C. BOARD etc. (ENB-087)



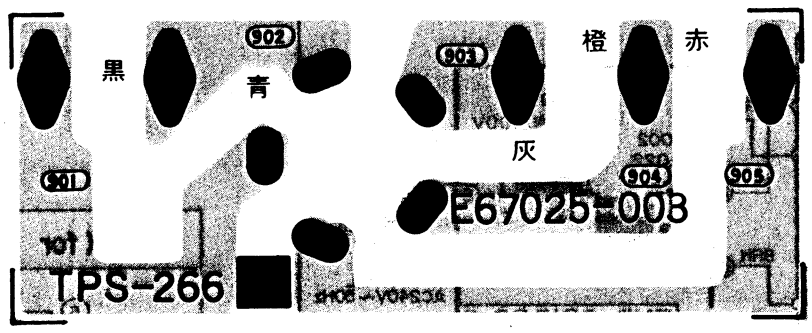
AGE SELECTOR P.C. BOARD (TPS-266)



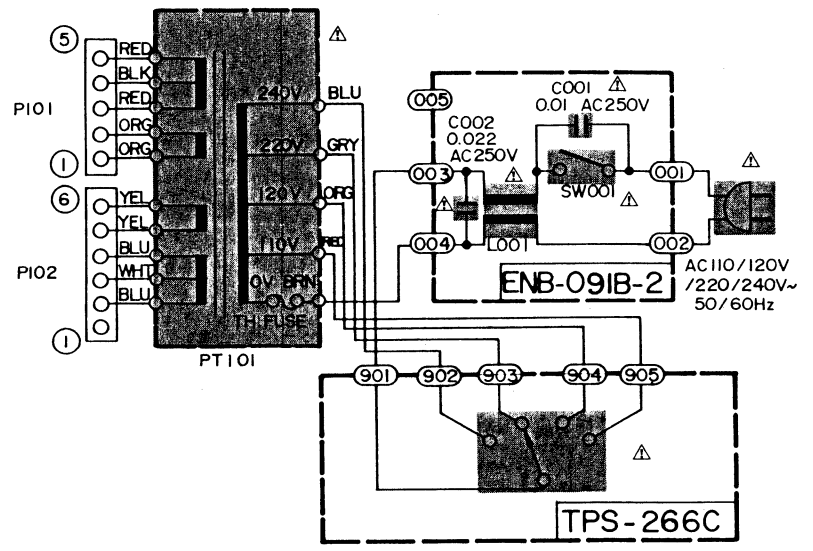
AL INTERFACE P.C. BOARD etc. (ENB-087)



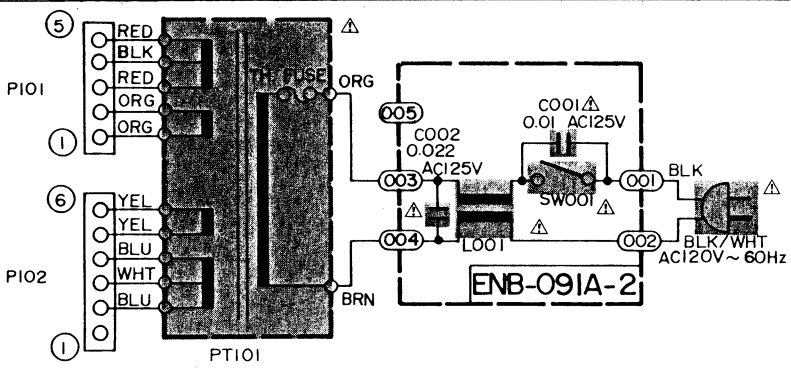
AGE SELECTOR P.C. BOARD (TPS-266)



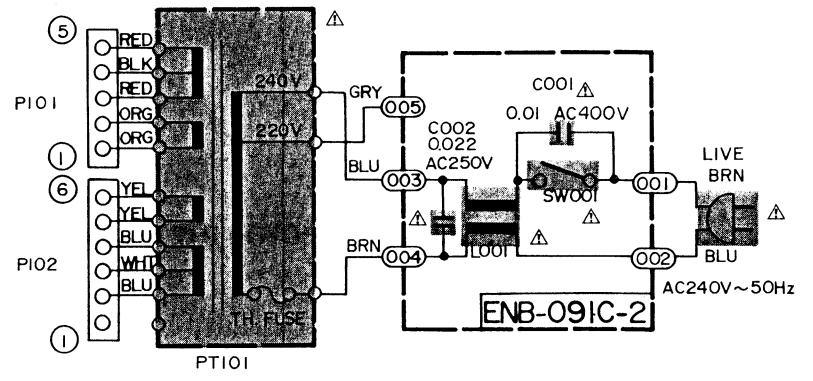
U (other Areas)



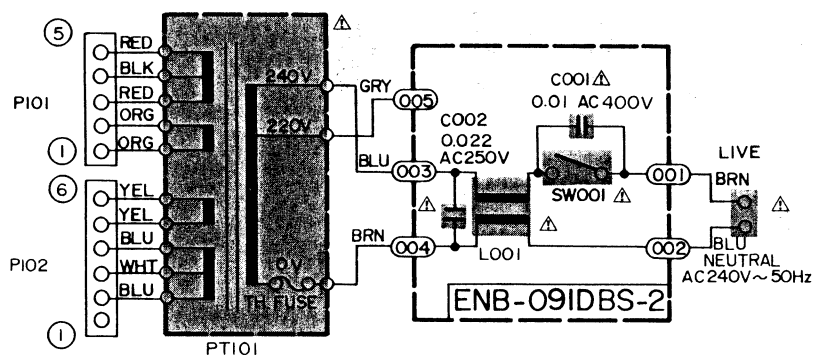
J (for U.S.A) C (for Canada)



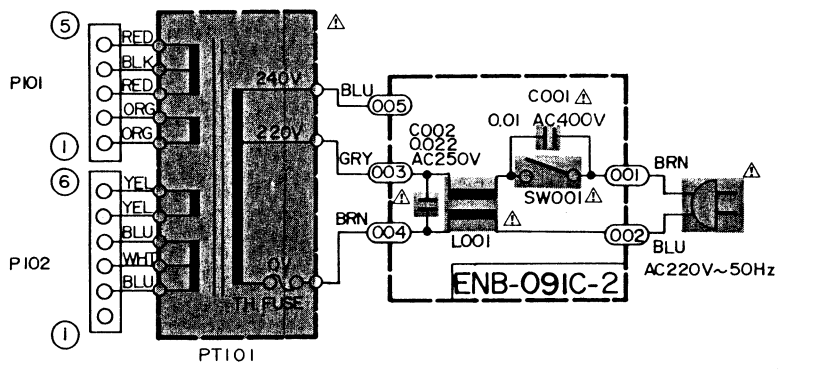
A (for Australia)



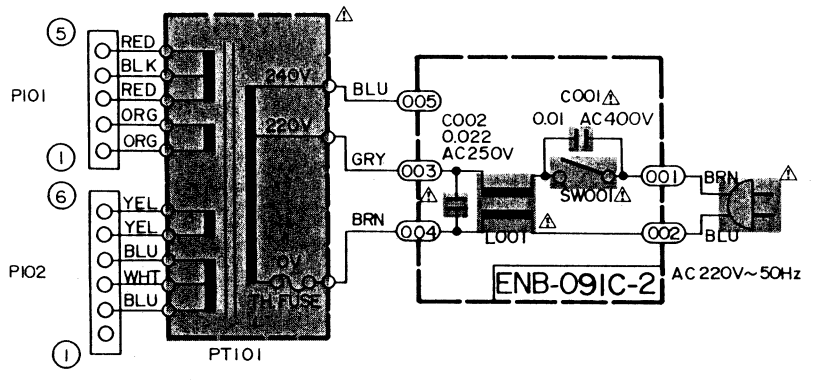
BS (for U.K)



G (for West Germany)



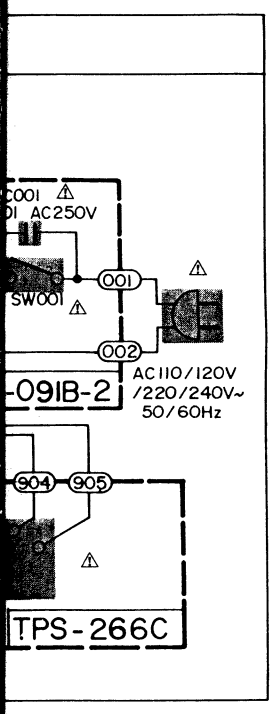
E (for Continental Europe) EF (for Continental Europe)

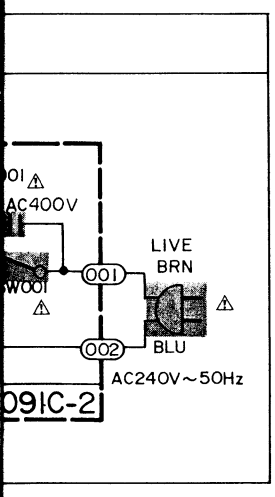


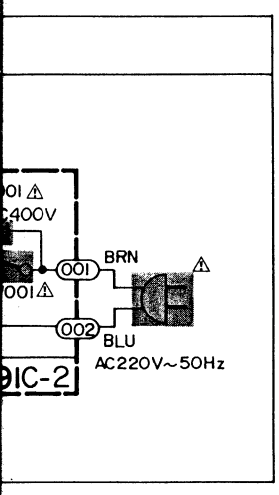
FL001

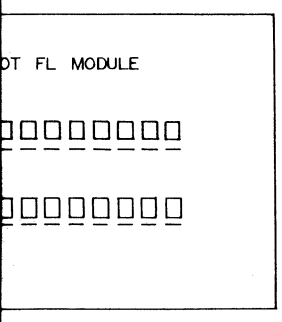
1	D7	D6	2
3	D5	D4	4
5	D3	D2	6
7	D1	DØ	8
9	D. GND	WR	10
11	$\overline{AØ}$	RD	12
13	$\overline{CS2}$	TØ	14
15	RESET	D. GND	16
17	+5V	+5V	18
19	+40V	+40V	20
21	FLCT	FLi	22
23	FL2		

20WORDS x 2LINE 5 x 7 DOT FL MODULE









—How to Use Schematic Diagrams—

1. ▒▒▒ indicates analog singnal path.
2. ▬▬▬ indicates digital signal path.
3. ◁▪▪ indicates LINE OPTICAL IN.
4. ▬ ▬ ▬ indicates a reverberation digital signal.
5. The waveform and voltage value shown in the photo was measured in TEST 1 mode by inputting a signal of 1 kHz, 2 Vrms to the analog LINE IN.
6. ——— indicates the +B line.
7. — — — indicates the −B line.
8. Parts marked with ⚠ and those in the darkened area ▬ are parts for safety.
   Be sure to use one with the specified part number.
9. This is the standard schematic diagram. The schematics and circuit constants are subject to change for improvement without notice.

PARTS LIST

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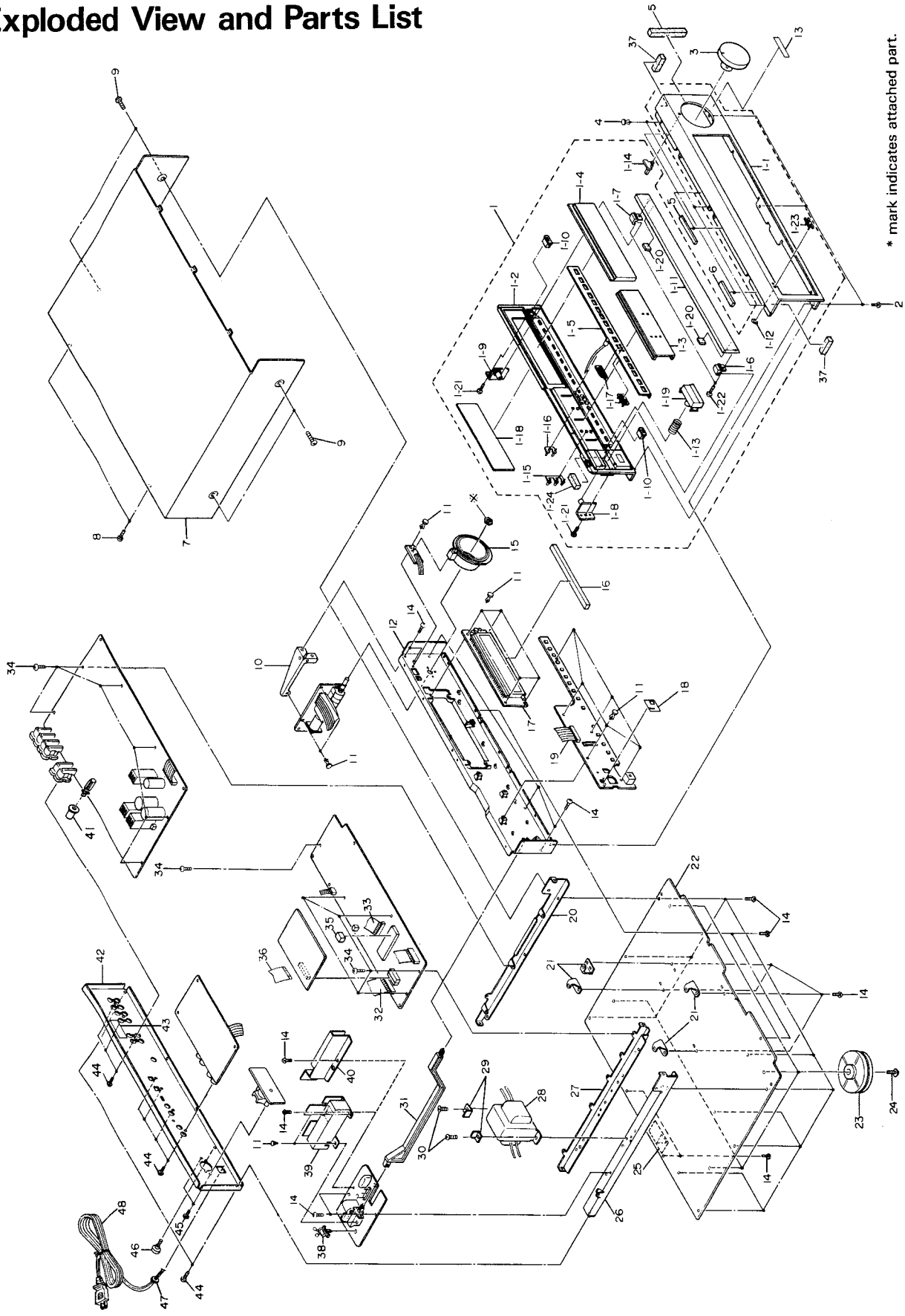
- TPS-266 Ⓒ Voltage Selector PC Board Ass'y 2- 9
- ENB-091 □ Digital Signal Processor PC Board Ass'y 2-10
- ENB-087 □ Digital Interface Receiver PC Board Ass'y 2-13

Accessories List 2-15
Packing Materials and Part Numbers 2-16

Exploded View and Parts List



■ Parts List

⚠	Item	Part Number	Part Name	Q'ty	Description	Areas
	1	EFP-XPA1010TNE	Front Panel Ass'y	1		
	1-1	E26054-005	Front Panel	1		
	1-2	E11761-003	Front Base Ass'y	1		
	1-3	E305495-002	Sub Panel	1		
	1-4	E305497-002	Window Screen	1		
	1-5	E305501-002	Plate	1		
	1-6	E305503-001	Hinge	1	Left	
	1-7	E305503-002	Hinge	1	Right	
	1-8	E305507-003	Hinge Holder	1	Left	
	1-9	E305507-004	Hinge Holder	1	Right	
	1-10	E305513-001	Magnet	2		
	1-11	E305612-003	Door Ass'y	1		
	1-12	E60912-003	Speed Nut	1		
	1-13	E66722-041	Spring	1		
	1-14	E74800-001	Indicator	1		
	1-15	E74837-001	Indicator	1		
	1-16	E74837-002	Indicator	1		
	1-17	E74838-001	Indicator	2		
	1-18	E74882-002	FL Screen	1		
	1-19	E75436-001	Push Button Ass'y	1		
	1-20	EXO008005H03S11	Spacer	2		
	1-21	SBSF3010M	Screw	2		
	1-22	SPSP2604M	Screw	2		
	1-23	E72968-001	JVC Mark	1		
	1-24	EXO010007N30S02	Spacer	1		
	2	SDSB3008M	Screw	3		
	3	E305505-002	Volume Knob	1		
	4	E48729-009	Plastic Rivet	3		
	5	EXO075005N40S02	Felt Spacer	3		
	6	EXO050005N40S02	Felt Spacer	2		
	7	E26058-003	Metal Cover	1		
	8	SBSG3008M	Screw	2		
	9	SDSE3008M	Screw	4		
	10	E74806-002	Volume Bracket	1		
	11	E48729-008	Plastic Rivet	12		J,C,U
		E48729-008	Plastic Rivet	14		Except J,C,U
	12	E11754-001	Front Bracket	1		
	13	E49267-001	Origin Marking Label	1		BS
	14	SBSE3008CC	Screw	25		
	15	E305516-002	Knob Ring	1		
	16	EXO140005N30S02	Spacer	1		
	17	ELU0001-058	FL Tube	1		
	18	E74990-001	Sheet	1		
	19	EWR1ME-10TT	Flat Wire	1		
	20	E304891-003	Side Bracket	1	Right	
	21	E68587-008	Bracket	4		
	22	E11755-001	Bottom Cover	1		
	23	E75088-014	Foot	4		
	24	SDST4010CC	Special Screw	4		
	25	E70281-001	Caution Label	1		J
		E70115-002	Caution Label	1		BS
	26	E304889-002	Side Bracket	1	Left	
	27	E304890-006	Center Bracket	1		
⚠	28	ETP1020-32JA	Power Transformer	1	PT101	J,C
⚠		ETP1020-32HA	Power Transformer	1	PT101	U
⚠		ETP1020-32EA	Power Transformer	1	PT101	E,EF,A,G
⚠		ETP1020-32EABS	Power Transformer	1	PT101	BS
	29	E72606-001	Trans Bracket	2		
	30	E65389-004	Special Screw	2		
	31	E305514-001	Push Shaft	1		

⚠ Safety Parts

⚠	Item	Part Number	Part Name	Q'ty	Description	Areas
	32	EW1RG-07TT	Flat Wire	1		
	33	EWR1PG-22TT	Flat Wire	1		
	34	GBSG3008CC	Screw	11		
	35	E3400-416	Spacer	1		
	36	EWR1KE-29TT	Flat Wire	1		
	37	EXO024005N40S02	Spacer	2		
	38	QHW2052-001	Wire Clamp	1		
	39	E305675-002	Primany Cover	1		Except J,C,U
	40	E75021-001	Primany Sheet	1		J,C,U
	41	C40755-002	Push Knob	1		
	42	E26056-009	Rear Panel	1		J,C
		E26056-010	Rear Panel	1		U
		E26056-011	Rear Panel	1		Except J,C,U
	—	E303260-196	Rating Lable	1		E,EF,G
	43	E75141-001	Caution Label	1		J
	44	E73273-003	Special Screw	9		
	45	E73273-002	Special Screw	2		U
	46	E73562-003	Special Screw	1		
⚠	47	QHS3771-108	Cord Stopper	1		Except BS
⚠		QHS3771-108BS	Cord Stopper	1		BS
⚠	48	QMP1480-200	Power Cord	1		J,C
⚠		QMP7600-200	Power Cord	1		U
⚠		QMP3900-200	Power Cord	1		E,EF,G
⚠		QMP2560-244	Power Cord	1		A
⚠		QMP9017-008BS	Power Cord	1		BS

⚠ Safety Parts

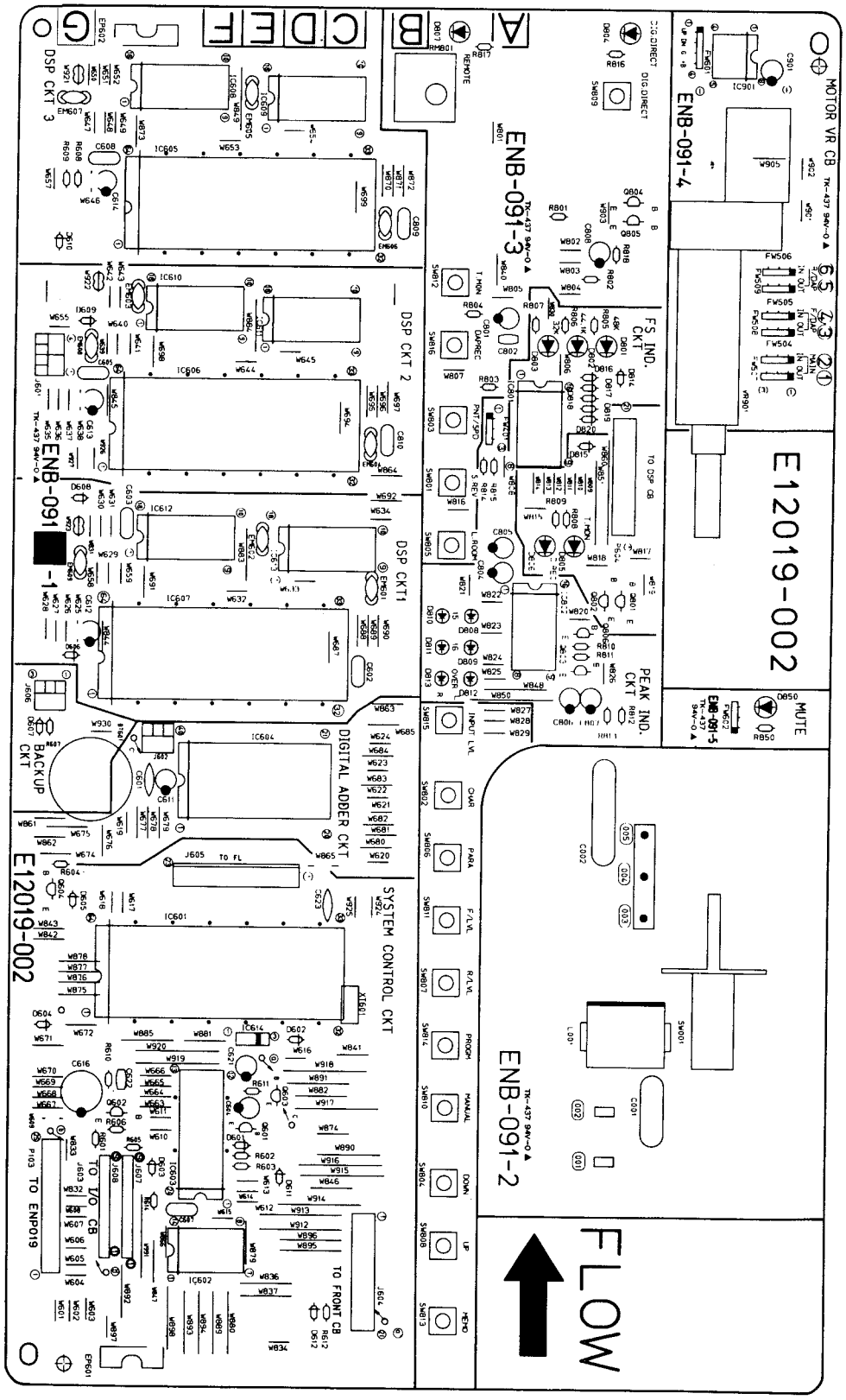
The Marks for Designated Areas

J·····the U.S.A.
C·····Canada
A·····Australia
E,EF·····Continental Europe
G·····West Germany
BS·····the U.K.
U·····Other Countries
No mark indicates all areas.

Printed Circuit Board Ass'y and Parts List

■ ENP-019 □ A/D, D/A PC Board Ass'y

Note: ENP-019 □ varies according to the areas employed. See note (1) when placing an order.



Note (1)

PC Board Ass'y	Designated Areas
ENP-019 Ⓐ	the U.S.A., Canada
ENP-019 Ⓑ	Australia, Continental Europe, West Germany, the U.K., Other Countries

TRANSISTORS

⚠	ITEM	PART NUMBER	DESCRIPTION	MAKER	AREA
	Q101	2SD400MP(E,F)	SILICON	SANYO	
	Q201	2SD1302(S,T)	SILICON	MATSUSHITA	
	Q202	2SD1302(S,T)	SILICON	MATSUSHITA	
	Q204	2SD1302(T)	SILICON	MATSUSHITA	
	Q205	2SD1302(T)	SILICON	MATSUSHITA	
	Q207	DTC144ES	SILICON	ROHM	
	Q208	DTA144ES	SILICON	ROHM	
	Q209	DTC144ES	SILICON	ROHM	
	Q210	2SA564A(R,S)	SILICON	MATSUSHITA	
	Q301	2SD1302(S,T)	SILICON	MATSUSHITA	
	Q302	2SD1302(S,T)	SILICON	MATSUSHITA	
	Q304	2SD1302(T)	SILICON	MATSUSHITA	
	Q305	2SD1302(T)	SILICON	MATSUSHITA	
	Q401	2SC1685(R,S)	SILICON	MATSUSHITA	
	Q402	DTC144ES	SILICON	ROHM	
	Q501	DTC144ES	SILICON	ROHM	
	Q502	DTC144ES	SILICON	ROHM	
	Q503	DTA144ES	SILICON	ROHM	
	Q504	DTA144ES	SILICON	ROHM	
	Q505	DTA144ES	SILICON	ROHM	
	Q506	DTA144ES	SILICON	ROHM	
	Q507	2SD1302(S,T)	SILICON	MATSUSHITA	
	Q508	2SD1302(S,T)	SILICON	MATSUSHITA	
	Q509	2SD1302(S,T)	SILICON	MATSUSHITA	
	Q510	2SD1302(S,T)	SILICON	MATSUSHITA	
	Q511	2SD1302(S,T)	SILICON	MATSUSHITA	
	Q512	2SD1302(S,T)	SILICON	MATSUSHITA	
	Q513	DTC144ES	SILICON	ROHM	
	Q514	2SA564A(R,S)	SILICON	MATSUSHITA	
	Q515	DTC144ES	SILICON	ROHM	

I. C. S

⚠	ITEM	PART NUMBER	DESCRIPTION	MAKER	AREA
	IC101	NJM78M12FA	I.C.	DAINICHI	
	IC102	NJM79M12FA	I.C.	DAINICHI	
	IC103	NJM78M05FA	I.C.	DAINICHI	
	IC201	SM5814AP	I.C.	KANEMATSU	
	IC202	PCM56P-J	I.C.	NIHONBARBU	
	IC203	NJM5532D	I.C.	DAINICHI	
	IC204	UPD4053BC	I.C.	NEC	
	IC205	NJM5532SD	I.C.	DAINICHI	
	IC206	NJM5532SD	I.C.	DAINICHI	
	IC207	VC4580LD	I.C.	DAINICHI	
	IC208	VC4580LD	I.C.	DAINICHI	
	IC209	TC9176P	I.C.	TOSHIBA	
	IC210	VC4580LD	I.C.	DAINICHI	
	IC301	SM5814AP	I.C.	KANEMATSU	
	IC302	PCM56P-J	I.C.	NIHONBARBU	
	IC303	NJM5532D	I.C.	DAINICHI	
	IC304	UPD4053BC	I.C.	NEC	
	IC305	NJM5532SD	I.C.	DAINICHI	
	IC306	NJM5532SD	I.C.	DAINICHI	
	IC310	VC4580LD	I.C.	DAINICHI	
	IC311	VC4580LD	I.C.	DAINICHI	
	IC312	TC9176P	I.C.	TOSHIBA	
	IC401	VC4580L	I.C.	DAINICHI	
	IC402	VC4580LD	I.C.	DAINICHI	
	IC403	VC4580LD	I.C.	DAINICHI	
	IC404	TC9176P	I.C.	TOSHIBA	
	IC405	NJM5532SD	I.C.	DAINICHI	
	IC406	NJM5532SD	I.C.	DAINICHI	
	IC407	MN86081	I.C.	MATSUSHITA	
	IC408	MN86081	I.C.	MATSUSHITA	
	IC409	TC74HCU04AP	I.C.	TOSHIBA	
	IC501	LC4966	I.C.	SANYO	
	IC502	LC4966	I.C.	SANYO	
	IC503	VC4580LD	I.C.	DAINICHI	
	IC504	VC4580LD	I.C.	DAINICHI	

I. C. S

⚠	ITEM	PART NUMBER	DESCRIPTION	MAKER	AREA
	IC505	VC4580LD	I.C.	DAINICHI	
	IC506	VC4580LD	I.C.	DAINICHI	
	IC507	VC4580LD	I.C.	DAINICHI	
	IC510	MN1280(S)	I.C.	MATSUSHITA	

DIODES

⚠	ITEM	PART NUMBER	DESCRIPTION	MAKER	AREA
	D101	S1WB(A)	SILICON	SINDENGEN	
	D102	MTZ20JC	ZENER	ROHM	
	D103	MTZ20JC	ZENER	ROHM	
⚠	D105	ERA15-02L19	SILICON	KYOUDOU	
⚠	D106	ERA15-02L19	SILICON	KYOUDOU	
⚠	D107	ERA15-02L19	SILICON	KYOUDOU	
⚠	D108	ERA15-02L19	SILICON	KYOUDOU	
⚠	D109	ERA15-02L19	SILICON	KYOUDOU	
⚠	D110	ERA15-02L19	SILICON	KYOUDOU	
⚠	D111	ERA15-02L19	SILICON	KYOUDOU	
⚠	D112	ERA15-02L19	SILICON	KYOUDOU	
⚠	D113	ERA15-02L19	SILICON	KYOUDOU	
⚠	D114	ERA15-02L19	SILICON	KYOUDOU	
	D201	1SS133	SILICON	ROHM	
	D202	1SS133	SILICON	ROHM	
	D203	MTZ5.1JB	ZENER	ROHM	
	D204	MTZ5.1JB	ZENER	ROHM	
	D205	1SS133	SILICON	ROHM	
	D206	1SS133	SILICON	ROHM	
	D301	1SS133	SILICON	ROHM	
	D302	1SS133	SILICON	ROHM	
	D303	MTZ5.1JB	ZENER	ROHM	
	D304	MTZ5.1JB	ZENER	ROHM	
	D401	MTZ5.1JB	ZENER	ROHM	
	D501	1SS133	SILICON	ROHM	
	D502	1SS133	SILICON	ROHM	
	D503	1SS133	SILICON	ROHM	
	D504	1SS133	SILICON	ROHM	
	D505	1SS133	SILICON	ROHM	
	D506	1SS133	SILICON	ROHM	
	D507	1SS133	SILICON	ROHM	
	D508	1SS133	SILICON	ROHM	
	D509	1SS133	SILICON	ROHM	

CAPACITORS

⚠	ITEM	PART NUMBER	DESCRIPTION			AREA
	C101	QCF21HP-103	0.01MF	50V	CERAMIC	
	C102	QETB1JM-227	220MF	63V	ELECTRO	
	C103	QETB1HM-226	22MF	50V	ELECTRO	
	C104	QETB1HM-226	22MF	50V	ELECTRO	
	C105	QFN81HK-224	0.22MF	50V	MYLAR	
	C106	QETB1EM-478	4700MF	25V	ELECTRO	
	C107	QETB1EM-478	4700MF	25V	ELECTRO	
	C110	QCC21EM-473	0.047MF	25V	CERAMIC	
	C111	QCC21EM-473	0.047MF	25V	CERAMIC	
	C112	QETB1CM-478	4700MF	16V	ELECTRO	
	C113	QFN81HK-104	0.1MF	50V	MYLAR	
	C115	QETB1CM-227	220MF	16V	ELECTRO	
	C116	QETB1CM-108	1000MF	16V	ELECTRO	
	C117	QETB1CM-227	220MF	16V	ELECTRO	
	C118	QETB1CM-108	1000MF	16V	ELECTRO	
	C119	QETB1CM-478	4700MF	16V	ELECTRO	
	C120	QCGB1HK-102	1000PF	50V	CERAMIC	
	C121	QCGB1HK-102	1000PF	50V	CERAMIC	
	C122	QCGB1HK-102	1000PF	50V	CERAMIC	
	C123	QCGB1HK-102	1000PF	50V	CERAMIC	
	C124	QCF21HP-102	1000PF	50V	CERAMIC	
	C203	QCC21EM-473	0.047MF	25V	CERAMIC	
	C204	QETB1CM-476	47MF	16V	ELECTRO	
	C205	QCC21EM-473	0.047MF	25V	CERAMIC	
	C206	QCC21EM-473	0.047MF	25V	CERAMIC	
	C207	QCC21EM-473	0.047MF	25V	CERAMIC	
	C208	QETB1CM-476	47MF	16V	ELECTRO	
	C209	QFN81HK-103	0.01MF	50V	MYLAR	
	C210	QETB1CM-476	47MF	16V	ELECTRO	
	C211	QETB1CM-477	470MF	16V	ELECTRO	
	C212	QETB1AM-107	100MF	10V	ELECTRO	
	C213	QETB1AM-107	100MF	10V	ELECTRO	
	C214	QCGB1HK-102	1000PF	50V	CERAMIC	
	C215	QCSB1HJ-470	47PF	50V	CERAMIC	
	C216	QCSB1HJ-470	47PF	50V	CERAMIC	

⚠ : SAFETY PARTS

CAPACITORS

⚠	ITEM	PART NUMBER	DESCRIPTION			AREA
	C217	EFZ0101-560S	56PF		M.MYLAR	
	C218	EFZ0101-560S	56PF		M.MYLAR	
	C219	QFV81HJ-104	0.1MF	50V	T.FILM	
	C220	QFV81HJ-104	0.1MF	50V	T.FILM	
	C221	QFN81HJ-682	6800PF	50V	MYLAR	
	C222	QFN81HJ-682	6800PF	50V	MYLAR	
	C223	QFN81HJ-563	0.056MF	50V	MYLAR	
	C224	QFN81HJ-563	0.056MF	50V	MYLAR	
	C225	QFP81HG-512	5100PF	50V	POLY	
	C226	QFP81HG-512	5100PF	50V	POLY	
	C227	QFP81HG-621	620PF	50V	POLY	
	C228	QFP81HG-621	620PF	50V	POLY	
	C229	QFV81HJ-104	0.1MF	50V	T.FILM	
	C230	QFV81HJ-104	0.1MF	50V	T.FILM	
	C231	QETB1EM-106	10MF	25V	ELECTRO	
	C232	QETB1EM-106	10MF	25V	ELECTRO	
	C233	QFP81HG-562	5600PF	50V	POLY	
	C234	QFP81HG-562	5600PF	50V	POLY	
	C236	QCGB1HK-102	1000PF	50V	CERAMIC	
	C237	QETB1CM-477	470MF	16V	ELECTRO	
	C238	QETB1CM-476	47MF	16V	ELECTRO	
	C239	QETB1CM-476	47MF	16V	ELECTRO	
	C240	QETB1CM-476	47MF	16V	ELECTRO	
	C241	QETB1CM-476	47MF	16V	ELECTRO	
	C242	QETB1CM-476	47MF	16V	ELECTRO	
	C243	QETB1CM-476	47MF	16V	ELECTRO	
	C301	QFN81HK-103	0.01MF	50V	MYLAR	
	C302	QCC21EM-473	0.047MF	25V	CERAMIC	
	C303	QCC21EM-473	0.047MF	25V	CERAMIC	
	C304	QETB1CM-476	47MF	16V	ELECTRO	
	C306	QCZ0205-155	1.5MF	25V	CERAMIC	
	C307	QCC21EM-473	0.047MF	25V	CERAMIC	
	C308	QETB1CM-476	47MF	16V	ELECTRO	
	C309	QETB1CM-477	470MF	16V	ELECTRO	
	C310	QETB1CM-476	47MF	16V	ELECTRO	
	C311	QCC21EM-473	0.047MF	25V	CERAMIC	
	C312	QETB1AM-107	100MF	10V	ELECTRO	
	C313	QETB1AM-107	100MF	10V	ELECTRO	
	C315	QCSB1HJ-470	47PF	50V	CERAMIC	
	C316	QCSB1HJ-470	47PF	50V	CERAMIC	
	C317	EFZ0101-560S	56PF		M.MYLAR	
	C318	EFZ0101-560S	56PF		M.MYLAR	
	C319	QFV81HJ-104	0.1MF	50V	T.FILM	
	C320	QFV81HJ-104	0.1MF	50V	T.FILM	
	C321	QFN81HJ-563	0.056MF	50V	MYLAR	
	C322	QFN81HJ-563	0.056MF	50V	MYLAR	
	C323	QFN81HJ-682	6800PF	50V	MYLAR	
	C324	QFN81HJ-682	6800PF	50V	MYLAR	
	C325	QFP81HG-512	5100PF	50V	POLY	
	C326	QFP81HG-512	5100PF	50V	POLY	
	C327	QFP81HG-621	620PF	50V	POLY	
	C328	QFP81HG-621	620PF	50V	POLY	
	C329	QFV81HJ-104	0.1MF	50V	T.FILM	
	C330	QFV81HJ-104	0.1MF	50V	T.FILM	
	C331	QETB1EM-106	10MF	25V	ELECTRO	
	C332	QETB1EM-106	10MF	25V	ELECTRO	
	C333	QFP81HG-562	5600PF	50V	POLY	
	C334	QFP81HG-562	5600PF	50V	POLY	
	C355	QETB1CM-476	47MF	16V	ELECTRO	
	C356	QETB1CM-476	47MF	16V	ELECTRO	
	C357	QETB1CM-476	47MF	16V	ELECTRO	
	C358	QETB1CM-476	47MF	16V	ELECTRO	
	C401	QETB1HM-475	4.7MF	50V	ELECTRO	
	C402	QETB1HM-475	4.7MF	50V	ELECTRO	
	C404	QCZ0205-155	1.5MF	25V	CERAMIC	
	C405	QETB1CM-476	47MF	16V	ELECTRO	
	C406	QETB1CM-476	47MF	16V	ELECTRO	
	C407	QETB1CM-476	47MF	16V	ELECTRO	
	C409	QETB1CM-476	47MF	16V	ELECTRO	
	C410	QETB1CM-476	47MF	16V	ELECTRO	
	C411	QFP81HJ-222	2200PF	50V	POLY	
	C412	QFP81HJ-222	2200PF	50V	POLY	
	C413	QFP81HJ-151	150PF	50V	POLY	
	C414	QFP81HJ-151	150PF	50V	POLY	
	C415	QFP81HJ-123	0.012MF	50V	POLY	

CAPACITORS

⚠	ITEM	PART NUMBER	DESCRIPTION			AREA
	C416	QFP81HJ-123	0.012MF	50V	POLY	
	C417	QETB1CM-476	47MF	16V	ELECTRO	
	C418	QETB1CM-476	47MF	16V	ELECTRO	
	C421	QCGB1HK-102	1000PF	50V	CERAMIC	
	C422	QCGB1HK-102	1000PF	50V	CERAMIC	
	C423	QETB1EM-106	10MF	25V	ELECTRO	
	C424	QETB1EM-106	10MF	25V	ELECTRO	
	C425	QCGB1HK-102	1000PF	50V	CERAMIC	
	C426	QCGB1HK-102	1000PF	50V	CERAMIC	
	C427	QFN81HK-104	0.1MF	50V	MYLAR	
	C428	QFN81HK-104	0.1MF	50V	MYLAR	
	C429	QETB1AM-107	100MF	10V	ELECTRO	
	C430	QETB1AM-107	100MF	10V	ELECTRO	
	C431	QETB1AM-477	470MF	10V	ELECTRO	
	C432	QETB1AM-477	470MF	10V	ELECTRO	
	C433	QETB1AM-107	100MF	10V	ELECTRO	
	C434	QETB1AM-107	100MF	10V	ELECTRO	
	C435	QETB1AM-107	100MF	10V	ELECTRO	
	C436	QCZ0205-155	1.5MF	25V	CERAMIC	
	C439	QFP81HJ-103	0.01MF	50V	POLY	
	C440	QFP81HJ-103	0.01MF	50V	POLY	
	C441	QCT30CH-100	10PF	50V	CERAMIC	
	C442	QCT30CH-100	10PF	50V	CERAMIC	
	C443	QCZ0205-155	1.5MF	25V	CERAMIC	
	C444	QCZ0205-155	1.5MF	25V	CERAMIC	
	C445	QCF21HP-102	1000PF	50V	CERAMIC	
	C446	QCZ0205-155	1.5MF	25V	CERAMIC	
	C447	QCZ0205-155	1.5MF	25V	CERAMIC	
	C501	QETB1CM-476	47MF	16V	ELECTRO	
	C502	QETB1CM-476	47MF	16V	ELECTRO	
	C503	QCBB1HK-331	330PF	50V	CERAMIC	
	C504	QCBB1HK-331	330PF	50V	CERAMIC	
	C505	QETB1HM-475	4.7MF	50V	ELECTRO	
	C506	QETB1HM-475	4.7MF	50V	ELECTRO	
	C507	QCBB1HK-221	220PF	50V	CERAMIC	
	C508	QCBB1HK-221	220PF	50V	CERAMIC	
	C509	QETB1HM-475	4.7MF	50V	ELECTRO	
	C510	QETB1HM-475	4.7MF	50V	ELECTRO	
	C515	QCBB1HK-221	220PF	50V	CERAMIC	
	C516	QCBB1HK-221	220PF	50V	CERAMIC	
	C517	QETB1HM-475	4.7MF	50V	ELECTRO	
	C518	QETB1HM-475	4.7MF	50V	ELECTRO	
	C519	QCBB1HK-221	220PF	50V	CERAMIC	
	C520	QCBB1HK-221	220PF	50V	CERAMIC	
	C521	QETB1HM-475	4.7MF	50V	ELECTRO	
	C522	QETB1HM-475	4.7MF	50V	ELECTRO	
	C523	QCBB1HK-331	330PF	50V	CERAMIC	
	C524	QCBB1HK-331	330PF	50V	CERAMIC	
	C525	QETB1HM-475	4.7MF	50V	ELECTRO	
	C526	QETB1HM-475	4.7MF	50V	ELECTRO	
	C527	QCBB1HK-221	220PF	50V	CERAMIC	
	C528	QCBB1HK-221	220PF	50V	CERAMIC	
	C529	QETB1CM-227	220MF	16V	ELECTRO	
	C533	QETB1EM-106	10MF	25V	ELECTRO	
	C534	QCGB1HK-102	1000PF	50V	CERAMIC	
	C535	QETB1CM-107	100MF	16V	ELECTRO	
	C539	QETB1CM-227	220MF	16V	ELECTRO	
	C541	QETB1HM-475	4.7MF	50V	ELECTRO	
	C551	QCVB1CM-103	0.01MF	16V	CERAMIC	
	C552	QCVB1CM-103	0.01MF	16V	CERAMIC	
	C553	QCVB1CM-103	0.01MF	16V	CERAMIC	
	C557	QCBB1HK-221	220PF	50V	CERAMIC	
	C558	QCBB1HK-221	220PF	50V	CERAMIC	
	C559	QCBB1HK-221	220PF	50V	CERAMIC	
	C560	QCBB1HK-221	220PF	50V	CERAMIC	

⚠ : SAFETY PARTS

RESISTORS

⚠	ITEM	PART NUMBER	DESCRIPTION			AREA
	R101	QRD167J-332	3.3K	1/6W	CARBON	
	R102	QRD167J-271	270	1/6W	CARBON	
⚠	R103	QRZ0077-100	10	1/4W	FUSIBLE	
⚠	R104	QRZ0077-100	10	1/4W	FUSIBLE	
⚠	R105	QRZ0077-100	10	1/4W	FUSIBLE	
⚠	R106	QRZ0077-100	10	1/4W	FUSIBLE	
⚠	R107	QRZ0077-100	10	1/4W	FUSIBLE	
⚠	R108	QRZ0077-100	10	1/4W	FUSIBLE	
⚠	R109	QRZ0077-470	47	1/4W	FUSIBLE	
⚠	R110	QRZ0077-470	47	1/4W	FUSIBLE	
	R111	QRD167J-102	1K	1/6W	CARBON	
	R201	QRD167J-224	220K	1/6W	CARBON	
	R202	QRD167J-105	1M	1/6W	CARBON	
	R203	QRD167J-474	470K	1/6W	CARBON	
	R205	QRD167J-102	1K	1/6W	CARBON	
	R206	QRD167J-102	1K	1/6W	CARBON	
	R207	QRD167J-272	2.7K	1/6W	CARBON	
	R208	QRD167J-272	2.7K	1/6W	CARBON	
	R209	QRD167J-102	1K	1/6W	CARBON	
	R210	QRD167J-102	1K	1/6W	CARBON	
	R211	QRD167J-102	1K	1/6W	CARBON	
	R212	QRD167J-102	1K	1/6W	CARBON	
	R213	QRD167J-332	3.3K	1/6W	CARBON	
	R214	QRD167J-332	3.3K	1/6W	CARBON	
	R215	QRD167J-751	750	1/6W	CARBON	
	R216	QRD167J-751	750	1/6W	CARBON	
	R217	QRD167J-241	240	1/6W	CARBON	
	R218	QRD167J-241	240	1/6W	CARBON	
	R219	QRD167J-105	1M	1/6W	CARBON	
	R220	QRD167J-105	1M	1/6W	CARBON	
	R221	QRD167J-222	2.2K	1/6W	CARBON	
	R222	QRD167J-222	2.2K	1/6W	CARBON	
	R223	QRD167J-103	10K	1/6W	CARBON	
	R224	QRD167J-103	10K	1/6W	CARBON	
	R225	QRD167J-202	2K	1/6W	CARBON	
	R226	QRD167J-202	2K	1/6W	CARBON	
	R227	QRD167J-622	6.2K	1/6W	CARBON	
	R228	QRD167J-622	6.2K	1/6W	CARBON	
	R229	QRD167J-473	47K	1/6W	CARBON	
	R230	QRD167J-473	47K	1/6W	CARBON	
	R231	QRD167J-221	220	1/6W	CARBON	
	R232	QRD167J-221	220	1/6W	CARBON	
	R233	QRD167J-221	220	1/6W	CARBON	
	R234	QRD167J-221	220	1/6W	CARBON	
	R237	QRD167J-223	22K	1/6W	CARBON	
	R238	QRD167J-223	22K	1/6W	CARBON	
	R239	QRD167J-103	10K	1/6W	CARBON	
	R240	QRD167J-105	1M	1/6W	CARBON	
	R251	QRD167J-223	22K	1/6W	CARBON	
	R252	QRD167J-223	22K	1/6W	CARBON	
	R253	QRD167J-223	22K	1/6W	CARBON	
	R254	QRD167J-223	22K	1/6W	CARBON	
	R261	QRD167J-102	1K	1/6W	CARBON	
	R262	QRD167J-474	470K	1/6W	CARBON	
	R263	QRD167J-105	1M	1/6W	CARBON	
	R264	QRD167J-104	100K	1/6W	CARBON	
	R265	QRD167J-472	4.7K	1/6W	CARBON	
	R266	QRD167J-472	4.7K	1/6W	CARBON	
	R267	QRD167J-472	4.7K	1/6W	CARBON	
	R268	QRD167J-472	4.7K	1/6W	CARBON	
	R269	QRD167J-474	470K	1/6W	CARBON	
	R270	QRD167J-474	470K	1/6W	CARBON	
	R271	QRD167J-474	470K	1/6W	CARBON	
	R272	QRD167J-474	470K	1/6W	CARBON	
	R302	QRD167J-474	470K	1/6W	CARBON	
	R303	QRD167J-105	1M	1/6W	CARBON	
	R304	QRD167J-224	220K	1/6W	CARBON	
	R305	QRD167J-102	1K	1/6W	CARBON	
	R306	QRD167J-102	1K	1/6W	CARBON	
	R307	QRD167J-272	2.7K	1/6W	CARBON	
	R308	QRD167J-272	2.7K	1/6W	CARBON	
	R309	QRD167J-102	1K	1/6W	CARBON	
	R310	QRD167J-102	1K	1/6W	CARBON	
	R311	QRD167J-102	1K	1/6W	CARBON	
	R312	QRD167J-102	1K	1/6W	CARBON	
	R313	QRD167J-332	3.3K	1/6W	CARBON	
	R314	QRD167J-332	3.3K	1/6W	CARBON	
	R315	QRD167J-751	750	1/6W	CARBON	
	R316	QRD167J-751	750	1/6W	CARBON	
	R317	QRD167J-222	2.2K	1/6W	CARBON	
	R318	QRD167J-222	2.2K	1/6W	CARBON	
	R319	QRD167J-241	240	1/6W	CARBON	
	R320	QRD167J-241	240	1/6W	CARBON	
	R321	QRD167J-105	1M	1/6W	CARBON	
	R322	QRD167J-105	1M	1/6W	CARBON	
	R323	QRD167J-103	10K	1/6W	CARBON	
	R324	QRD167J-103	10K	1/6W	CARBON	
	R325	QRD167J-202	2K	1/6W	CARBON	
	R326	QRD167J-202	2K	1/6W	CARBON	
	R327	QRD167J-622	6.2K	1/6W	CARBON	

RESISTORS

⚠	ITEM	PART NUMBER	DESCRIPTION			AREA
	R328	QRD167J-622	6.2K	1/6W	CARBON	
	R331	QRD167J-473	47K	1/6W	CARBON	
	R332	QRD167J-473	47K	1/6W	CARBON	
	R335	QRD167J-221	220	1/6W	CARBON	
	R336	QRD167J-221	220	1/6W	CARBON	
	R337	QRD167J-221	220	1/6W	CARBON	
	R338	QRD167J-221	220	1/6W	CARBON	
	R340	QRD167J-223	22K	1/6W	CARBON	
	R341	QRD167J-223	22K	1/6W	CARBON	
	R343	QRD167J-474	470K	1/6W	CARBON	
	R344	QRD167J-474	470K	1/6W	CARBON	
	R345	QRD167J-474	470K	1/6W	CARBON	
	R346	QRD167J-474	470K	1/6W	CARBON	
	R401	QRD167J-472	4.7K	1/6W	CARBON	
	R402	QRD167J-472	4.7K	1/6W	CARBON	
	R404	QRD167J-102	1K	1/6W	CARBON	
	R407	QRD167J-101	100	1/6W	CARBON	
	R410	QRD167J-102	1K	1/6W	CARBON	
	R411	QRD167J-202	2K	1/6W	CARBON	
	R413	QRD167J-222	2.2K	1/6W	CARBON	
	R414	QRD167J-222	2.2K	1/6W	CARBON	
	R415	QRD167J-222	2.2K	1/6W	CARBON	
	R416	QRD167J-222	2.2K	1/6W	CARBON	
	R419	QRD167J-472	4.7K	1/6W	CARBON	
	R420	QRD167J-472	4.7K	1/6W	CARBON	
	R421	QRD167J-472	4.7K	1/6W	CARBON	
	R422	QRD167J-472	4.7K	1/6W	CARBON	
	R423	QRD167J-472	4.7K	1/6W	CARBON	
	R424	QRD167J-472	4.7K	1/6W	CARBON	
	R425	QRD167J-362	3.6K	1/6W	CARBON	
	R426	QRD167J-362	3.6K	1/6W	CARBON	
	R431	QRD167J-362	3.6K	1/6W	CARBON	
	R432	QRD167J-362	3.6K	1/6W	CARBON	
	R433	QRD167J-472	4.7K	1/6W	CARBON	
	R434	QRD167J-472	4.7K	1/6W	CARBON	
	R435	QRD167J-103	10K	1/6W	CARBON	
	R436	QRD167J-103	10K	1/6W	CARBON	
	R437	QRD167J-332	3.3K	1/6W	CARBON	
	R438	QRD167J-332	3.3K	1/6W	CARBON	
	R439	QRD167J-152	1.5K	1/6W	CARBON	
	R440	QRD167J-152	1.5K	1/6W	CARBON	
	R441	QRD167J-102	1K	1/6W	CARBON	
	R442	QRD167J-102	1K	1/6W	CARBON	
	R443	QRD167J-474	470K	1/6W	CARBON	
	R444	QRD167J-474	470K	1/6W	CARBON	
	R445	QRD167J-105	1M	1/6W	CARBON	
	R446	QRD167J-471	470	1/6W	CARBON	
	R447	QRD167J-474	470K	1/6W	CARBON	
	R448	QRD167J-474	470K	1/6W	CARBON	
	R449	QRD167J-221	220	1/6W	CARBON	
	R450	QRD167J-221	220	1/6W	CARBON	
	R501	QRD167J-103	10K	1/6W	CARBON	
	R502	QRD167J-103	10K	1/6W	CARBON	
	R503	QRD167J-473	47K	1/6W	CARBON	
	R504	QRD167J-473	47K	1/6W	CARBON	
	R505	QRD167J-103	10K	1/6W	CARBON	
	R506	QRD167J-103	10K	1/6W	CARBON	
	R507	QRD167J-102	1K	1/6W	CARBON	
	R508	QRD167J-102	1K	1/6W	CARBON	
	R509	QRD167J-473	47K	1/6W	CARBON	
	R510	QRD167J-473	47K	1/6W	CARBON	
	R517	QRD167J-474	470K	1/6W	CARBON	
	R518	QRD167J-474	470K	1/6W	CARBON	
	R519	QRD167J-101	100	1/6W	CARBON	
	R520	QRD167J-101	100	1/6W	CARBON	
	R523	QRD167J-473	47K	1/6W	CARBON	
	R524	QRD167J-473	47K	1/6W	CARBON	
	R525	QRD167J-561	560	1/6W	CARBON	
	R526	QRD167J-561	560	1/6W	CARBON	
	R527	QRD167J-103	10K	1/6W	CARBON	
	R528	QRD167J-103	10K	1/6W	CARBON	
	R529	QRD167J-474	470K	1/6W	CARBON	
	R530	QRD167J-474	470K	1/6W	CARBON	
	R535	QRD167J-473	47K	1/6W	CARBON	
	R536	QRD167J-473	47K	1/6W	CARBON	
	R537	QRD167J-561	560	1/6W	CARBON	
	R538	QRD167J-561	560	1/6W	CARBON	
	R539	QRD167J-101	100	1/6W	CARBON	
	R540	QRD167J-101	100	1/6W	CARBON	
	R541	QRD167J-103	10K	1/6W	CARBON	
	R542	QRD167J-103	10K	1/6W	CARBON	
	R543	QRD167J-474	470K	1/6W	CARBON	
	R544	QRD167J-474	470K	1/6W	CARBON	
	R549	QRD167J-473	47K	1/6W	CARBON	
	R550	QRD167J-473	47K	1/6W	CARBON	

⚠ : SAFETY PARTS

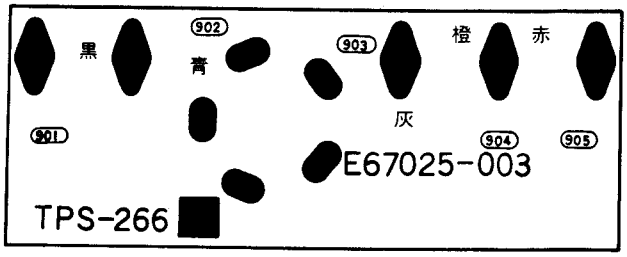
RESISTORS

⚠	ITEM	PART NUMBER	DESCRIPTION			AREA
	R551	QRD167J-103	10K	1/6W	CARBON	
	R552	QRD167J-103	10K	1/6W	CARBON	
	R553	QRD167J-561	560	1/6W	CARBON	
	R554	QRD167J-561	560	1/6W	CARBON	
	R555	QRD167J-101	100	1/6W	CARBON	
	R556	QRD167J-101	100	1/6W	CARBON	
	R557	QRD167J-102	1K	1/6W	CARBON	
	R558	QRD167J-102	1K	1/6W	CARBON	
	R559	QRD167J-473	47K	1/6W	CARBON	
	R560	QRD167J-473	47K	1/6W	CARBON	
	R567	QRD167J-221	220	1/6W	CARBON	
	R568	QRD167J-221	220	1/6W	CARBON	
	R569	QRD167J-472	4.7K	1/6W	CARBON	
	R570	QRD167J-474	470K	1/6W	CARBON	
	R571	QRD167J-224	220K	1/6W	CARBON	
	R572	QRD167J-105	1M	1/6W	CARBON	
	R581	QRD167J-823	82K	1/6W	CARBON	
	R582	QRD167J-103	10K	1/6W	CARBON	
	VR201	QVZ3518-104	100K	0.1W	VARIABLE	
	VR301	QVZ3518-104	100K	0.1W	VARIABLE	
	VR402	QVZ3518-472	4.7K	0.1W	VARIABLE	
	VR403	QVZ3518-472	4.7K	0.1W	VARIABLE	

OTHERS

⚠	ITEM	PART NUMBER	DESCRIPTION	AREA
		E12018-002	CIRCUIT BOARD	
		E74847-001	HEAT SINK	
		SBSE3008CC	SCREW	
	J101	QMV5005-005K	PLUG ASSY	
	J102	QMV5005-006K	PLUG ASSY	
	J103	EMV7123-025	CONNECTOR	
	J401	EMV7122-003	CONNECTOR	
	J501	EMN00TV-408A	4P PIN JACK	
	J502	EMN00TV-408A	4P PIN JACK	
	J503	EMN00TV-408A	4P PIN JACK	
	J504	EMV7122-003	CONNECTOR	
	J505	EMV7122-003	CONNECTOR	
	J506	EMV7122-003	CONNECTOR	
	J507	EMV7122-003	CONNECTOR	
	J508	EMV7122-003	CONNECTOR	
	J509	EMV7122-003	CONNECTOR	
	L507	EQL4004-3R3	INDUCTOR	
	L508	EQL4004-3R3	INDUCTOR	
	L519	EQL4004-3R3	INDUCTOR	
	L520	EQL4004-3R3	INDUCTOR	
	L539	EQL4004-3R3	INDUCTOR	
	L540	EQL4004-3R3	INDUCTOR	
	L555	EQL4004-3R3	INDUCTOR	
	L556	EQL4004-3R3	INDUCTOR	
	L557	EQL4004-3R3	INDUCTOR	
	L558	EQL4004-3R3	INDUCTOR	
	L567	EQL4004-3R3	INDUCTOR	
	L568	EQL4004-3R3	INDUCTOR	
	L569	EQL4004-3R3	INDUCTOR	
	L570	EQL4004-3R3	INDUCTOR	
	L571	EQL4004-3R3	INDUCTOR	
	L572	EQL4004-3R3	INDUCTOR	
	L573	EQL4004-3R3	INDUCTOR	
	L574	EQL4004-3R3	INDUCTOR	
⚠	CP101	ICP-N10	I.C. PROTECTOR	
⚠	CP102	ICP-N10	I.C. PROTECTOR	
⚠	CP103	ICP-N38	I.C. PROTECTOR	
	EM201	EQF0601-222T	EMI FILTER	
	EM401	EQF0601-222T	EMI FILTER	
	EM402	EQF0601-222	FILTER	
	EP101	E70859-001	EARTH PLATE	
	EP102	E70859-001	EARTH PLATE	
	EP103	E70859-001	EARTH PLATE	
	HS101	E70945-H35	HEAT SINK	
	HS102	E70945-H35	HEAT SINK	
	HS103	E70945-H40	HEAT SINK	
	SW501	QST9101-E01	PUSH SWITCH	
	XT401	ECX0024-576KF	RESONATOR	

■ **TPS-266 Ⓒ Voltage Selector PC Board Ass'y**
(Except for the U.S.A., Canada, Australia, Continental Europe, West Germany and the U.K.)



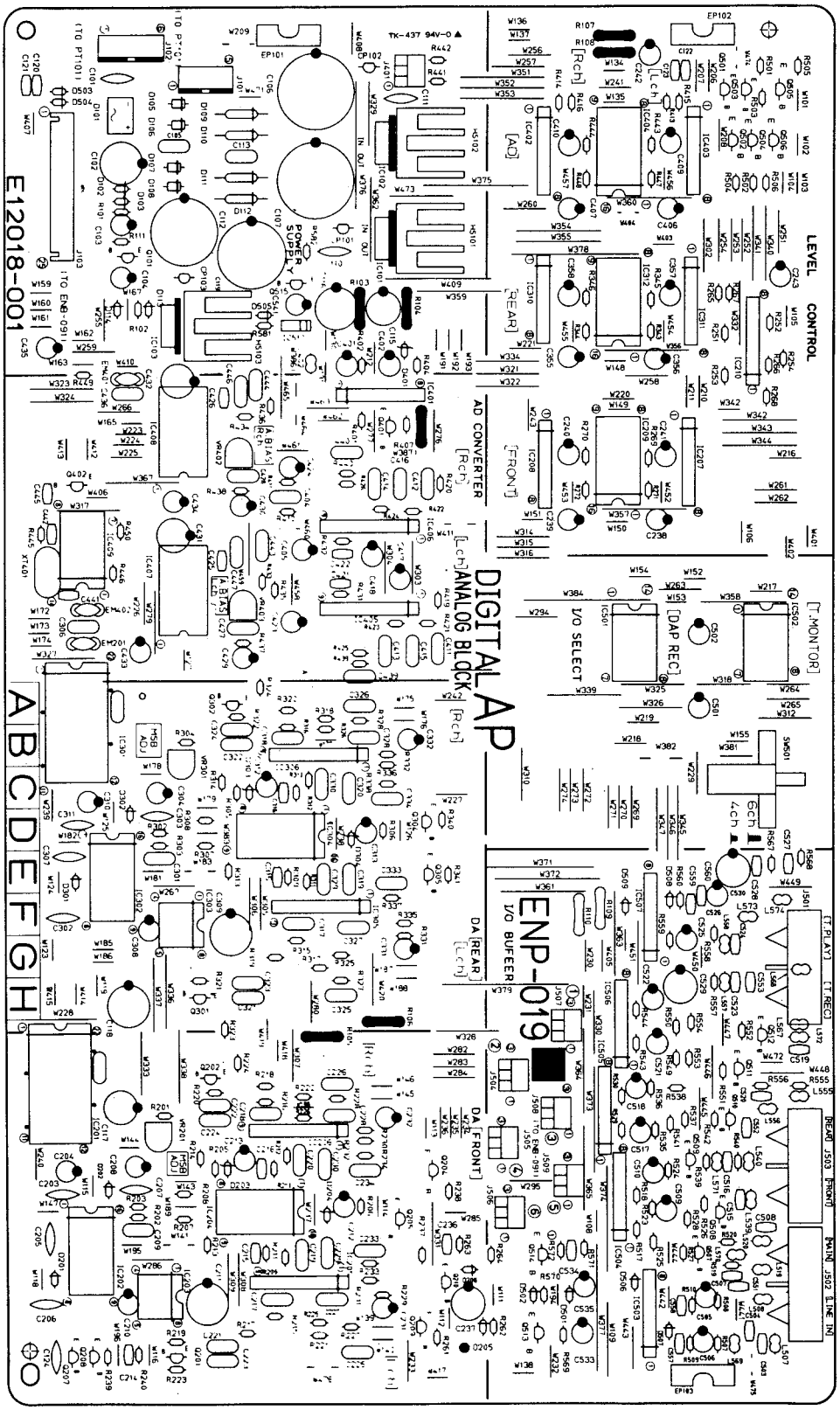
OTHERS

⚠	ITEM	PART NUMBER	DESCRIPTION	AREA
		E43727-002	PIN	C
		E66342-001	HOLDER	C
		E67025-003	CIRCUIT BOARD	C
⚠		QSR0074-001	VOLTAGE SELECTOR	C

⚠ : SAFETY PARTS

■ ENB-091☐ Digital Signal Processor PC Board Ass'y

Note: ENB-091☐ varies according to the areas employed. See note (1) when placing an order.



Note (1)

PC Board Ass'y	Designated Areas
ENB-091 Ⓐ	the U.S.A., Canada
ENB-091 Ⓑ	Other Countries
ENB-091 Ⓒ	Continental Europe, Australia, West Germany
ENB-091 Ⓓ BS	the U.K.

TRANSISTORS

⚠	ITEM	PART NUMBER	DESCRIPTION	MAKER	AREA
	Q601	DTC114ES	SILICON	ROHM	
	Q602	2SC1685(R,S)	SILICON	MATSUSHITA	
	Q603	DTC144ES	SILICON	ROHM	
	Q604	DTC144ES	SILICON	ROHM	
	Q801	DTC144ES	SILICON	ROHM	
	Q802	DTC144ES	SILICON	ROHM	
	Q803	DTC144ES	SILICON	ROHM	
	Q804	DTC144ES	SILICON	ROHM	
	Q805	DTC144ES	SILICON	ROHM	
	Q806	2SA564A(R,S)	SILICON	MATSUSHITA	

I. C. S

⚠	ITEM	PART NUMBER	DESCRIPTION	MAKER	AREA
	IC601	MN188321JSR3	I.C.	MATSUSHITA	
	IC602	TC74HC74AP	I.C.	TOSHIBA	
	IC603	LC3517BSL-15	I.C.	SANYO	
	IC604	VC4096	I.C.	MATSUSHITA	
	IC605	VC4097-002	I.C.	TOSHIBA	
	IC606	VC4097-003	I.C.	TOSHIBA	
	IC607	VC4097-003	I.C.	TOSHIBA	
	IC608	TMM41464AP-12	I.C.	TOSHIBA	
	IC609	TMM41464AP-12	I.C.	TOSHIBA	
	IC610	TMM41464AP-12	I.C.	TOSHIBA	
	IC611	TMM41464AP-12	I.C.	TOSHIBA	
	IC612	TMM41464AP-12	I.C.	TOSHIBA	
	IC613	TMM41464AP-12	I.C.	TOSHIBA	
	IC614	MN1280(P,Q)	I.C.	MATSUSHITA	
	IC801	TC74HC138AP	I.C.	TOSHIBA	
	IC802	IR2E27A	I.C.	SHARP	
	IC901	LB1639-CV	I.C.	SANYO	

DIODES

⚠	ITEM	PART NUMBER	DESCRIPTION	MAKER	AREA
	D601	1SS133	SILICON	ROHM	
	D602	1SS133	SILICON	ROHM	
	D603	1SS133	SILICON	ROHM	
	D604	1SS133	SILICON	ROHM	
	D605	1SS133	SILICON	ROHM	
	D606	1SS133	SILICON	ROHM	
	D607	1SS133	SILICON	ROHM	
	D608	1SS133	SILICON	ROHM	
	D609	1SS133	SILICON	ROHM	
	D610	1SS133	SILICON	ROHM	
	D611	1SS133	SILICON	ROHM	
	D612	1SS133	SILICON	ROHM	
	D801	SLR-34DC50F124	L.E.D.	ROHM	
	D802	SLR-34DC50F124	L.E.D.	ROHM	
	D803	SLR-34DC50F124	L.E.D.	ROHM	
	D804	SLR-34DC50F124	L.E.D.	ROHM	
	D805	SLR-34VC50F124	L.E.D.	ROHM	
	D806	SLR-34VC50F124	L.E.D.	ROHM	
	D807	SLR-34VC50F124	L.E.D.	ROHM	
	D808	SLR-34YC3F	L.E.D.	ROHM	
	D809	SLR-34YC3F	L.E.D.	ROHM	
	D810	SLR-34YC3F	L.E.D.	ROHM	
	D811	SLR-34YC3F	L.E.D.	ROHM	
	D812	SLR-34VC3F	L.E.D.	ROHM	
	D813	SLR-34VC3F	L.E.D.	ROHM	

DIODES

⚠	ITEM	PART NUMBER	DESCRIPTION	MAKER	AREA
	D814	1SS133	SILICON	ROHM	
	D815	1SS133	SILICON	ROHM	
	D816	1SS133	SILICON	ROHM	
	D817	1SS133	SILICON	ROHM	
	D818	1SS133	SILICON	ROHM	
	D819	1SS133	SILICON	ROHM	
	D820	1SS133	SILICON	ROHM	
	D850	SLR-34DC50F124	L.E.D.	ROHM	

CAPACITORS

⚠	ITEM	PART NUMBER	DESCRIPTION			AREA
	C001	QCZ9038-103	0.01MF		CERAMIC	A
	C001	QCZ9038-103	0.01MF		CERAMIC	B
	C001	QCZ9038-103	0.01MF		CERAMIC	C
	C001	QCZ9038-103BS	0.01MF		CERAMIC	DBS
	C002	QFZ9010-223	0.022MF	250V	M.PAPER	C
	C002	QFZ9019-223	0.022MF		M.MYLAR	A
	C002	QFZ9020-223	0.022MF		M.MYLAR	B
	C002	QFZ9020-223BS	0.022MF		M.MYLAR	DBS
	C601	QCC21EM-473	0.047MF	25V	CERAMIC	
	C602	QCZ0205-155	1.5MF	25V	CERAMIC	
	C603	QCZ0205-155	1.5MF	25V	CERAMIC	
	C604	QEK61HM-105G	1MF	50V	ELECTRO	
	C605	QCZ0205-155	1.5MF	25V	CERAMIC	
	C607	QCZ0205-155	1.5MF	25V	CERAMIC	
	C608	QCZ0205-155	1.5MF	25V	CERAMIC	
	C611	QETB1AM-107	100MF	10V	ELECTRO	
	C612	QETB1AM-107	100MF	10V	ELECTRO	
	C613	QETB1AM-107	100MF	10V	ELECTRO	
	C614	QER60JM-107	100MF	6.3V	ELECTRO	
	C616	QETB0JM-108	1000MF	6.3V	ELECTRO	
	C621	QER51HM-474G	0.47MF	50V	ELECTRO	
	C622	QCVB1CM-103	0.01MF	16V	CERAMIC	
	C623	QCY21HK-102	1000PF	50V	CERAMIC	
	C801	QER60JM-107	100MF	6.3V	ELECTRO	
	C802	QCHB1EZ-223	0.022MF	25V	CERAMIC	
	C804	QER51EM-106	10MF	25V	ELECTRO	
	C805	QER51EM-106	10MF	25V	ELECTRO	
	C806	QETB1HM-475	4.7MF	50V	ELECTRO	
	C807	QETB1HM-475	4.7MF	50V	ELECTRO	
	C808	QETB1HM-475	4.7MF	50V	ELECTRO	
	C809	QCZ0205-155	1.5MF	25V	CERAMIC	
	C810	QCZ0205-155	1.5MF	25V	CERAMIC	
	C901	QETB1AM-107	100MF	10V	ELECTRO	

RESISTORS

⚠	ITEM	PART NUMBER	DESCRIPTION			AREA
	R601	QRD167J-472	4.7K	1/6W	CARBON	
	R602	QRD167J-102	1K	1/6W	CARBON	
	R603	QRD167J-473	47K	1/6W	CARBON	
	R604	QRD167J-472	4.7K	1/6W	CARBON	
	R605	QRD167J-101	100	1/6W	CARBON	
	R606	QRD167J-103	10K	1/6W	CARBON	
	R607	QRD167J-271	270	1/6W	CARBON	
	R608	QRD167J-103	10K	1/6W	CARBON	
	R609	QRD167J-103	10K	1/6W	CARBON	
	R610	QRD167J-103	10K	1/6W	CARBON	
	R611	QRD167J-103	10K	1/6W	CARBON	
	R612	QRD167J-103	10K	1/6W	CARBON	
	R614	QRD167J-221	220	1/6W	CARBON	
	R801	QRD167J-103	10K	1/6W	CARBON	
	R802	QRD167J-103	10K	1/6W	CARBON	
	R803	QRD167J-103	10K	1/6W	CARBON	
	R804	QRD167J-103	10K	1/6W	CARBON	
	R805	QRD167J-181	180	1/6W	CARBON	
	R806	QRD167J-271	270	1/6W	CARBON	
	R807	QRD167J-271	270	1/6W	CARBON	
	R808	QRD167J-271	270	1/6W	CARBON	
	R809	QRD167J-271	270	1/6W	CARBON	
	R810	QRD167J-152	1.5K	1/6W	CARBON	
	R811	QRD167J-472	4.7K	1/6W	CARBON	
	R812	QRD167J-472	4.7K	1/6W	CARBON	
	R813	QRD167J-472	4.7K	1/6W	CARBON	
	R814	QRD167J-223	22K	1/6W	CARBON	
	R815	QRD167J-223	22K	1/6W	CARBON	
	R816	QRD167J-271	270	1/6W	CARBON	
	R817	QRD167J-271	270	1/6W	CARBON	
	R818	QRD167J-153	15K	1/6W	CARBON	
	R850	QRD167J-271	270	1/6W	CARBON	
	RM801	GP1U501X			SENSER	
	VR901	QVDC94A-E15B	100K		VARIABLE	

⚠ : SAFETY PARTS

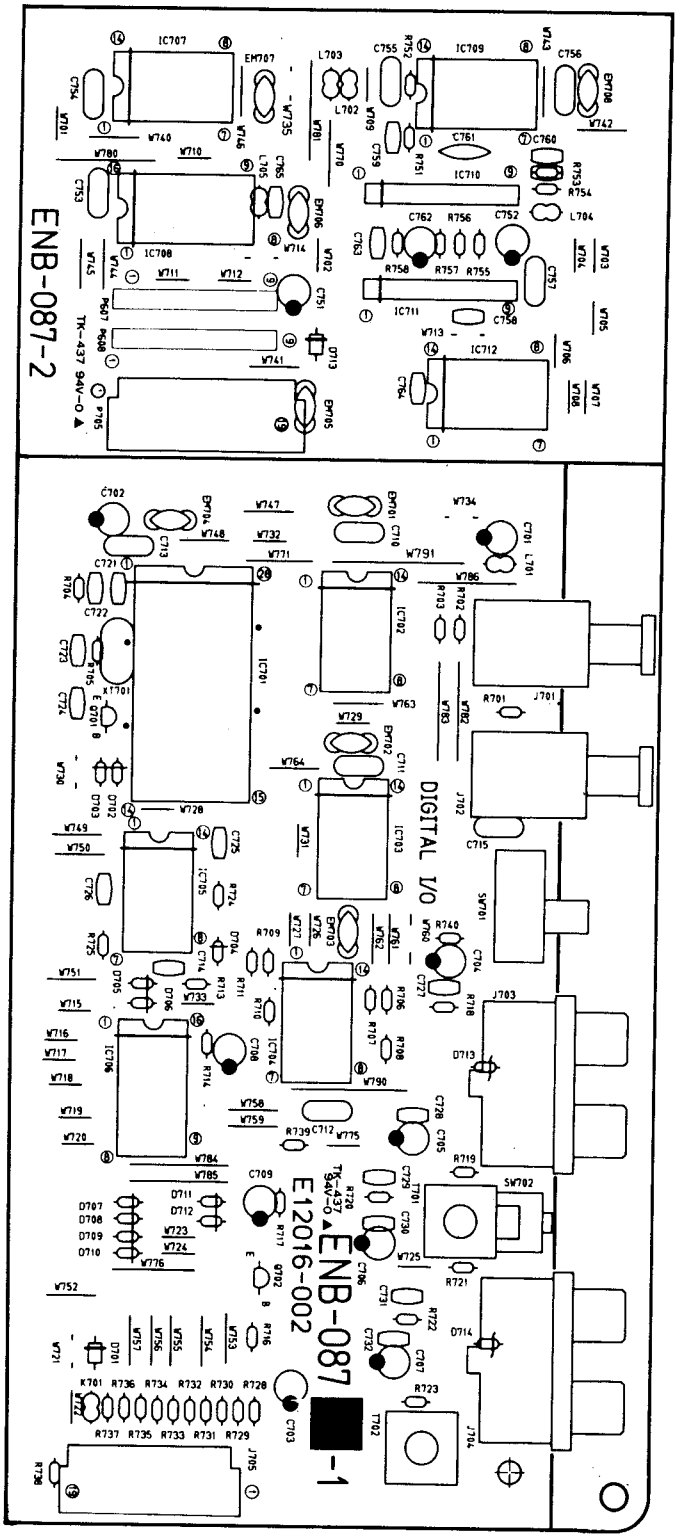
OTHERS

⚠	ITEM	PART NUMBER	DESCRIPTION	AREA
		E12019-002	CIRCUIT BOARD	
		E12019-002BS	CIRCUIT BOARD	DBS
		E33754-001	TIE BAND	
		E65508-002	TAB	
		E67764-203	WRAPPING TERMINAL	
	J601	EMV7122-004	CONNECTOR	
	J602	EMV7122-003	CONNECTOR	
	J604	EMV7123-021	CONNECTOR	
	J605	EMV7123-023	CONNECTOR	
	J606	EMV7122-003	CONNECTOR	
	J607	E306164-009	CONNECTOR	
	J608	E306164-009	CONNECTOR	
	L001	ENZ5002-005	FILTER	A
	L001	ENZ5002-005	FILTER	B
	L001	ENZ5002-005	FILTER	C
	L001	ENZ5002-005BS	LINE FILTER	DBS
	P103	EMV7123-025R	CONNECTOR	
	P604	EMV7123-021R	CONNECTOR	
	EM601	EQF0601-222T	EMI FILTER	
	EM602	EQF0601-222T	EMI FILTER	
	EM603	EQF0601-222T	EMI FILTER	
	EM604	EQF0601-222T	EMI FILTER	
	EM605	EQF0601-222T	EMI FILTER	
	EM606	EQF0601-222T	EMI FILTER	
	EM607	EQF0601-222T	EMI FILTER	
	EM608	EQF0601-222T	EMI FILTER	
	EM609	EQF0601-222T	EMI FILTER	
	EP601	E70859-001	EARTH PLATE	
	EP602	E70859-001	EARTH PLATE	
	FW401	EWR33B-35LST	FLAT WIRE	
	FW504	EWR23C-30LN	FLAT WIRE	
	FW505	EWR23C-30LN	FLAT WIRE	
	FW506	EWR23C-30LN	FLAT WIRE	
	FW507	EWR23C-30LN	FLAT WIRE	
	FW508	EWR23C-30LN	FLAT WIRE	
	FW509	EWR23C-30LN	FLAT WIRE	
	FW601	EWR34B-13LST	FLAT WIRE	
	FW602	EWR33B-25LST	FLAT WIRE	
	SW001	QSP4C11-E01	PUSH SWITCH	A
	SW001	QSP4C11-E01	PUSH SWITCH	B
	SW001	QSP4C11-E01	PUSH SWITCH	C
	SW001	QSP4C11-E01BS	PUSH SWITCH	DBS
	SW801	ESP0001-018	TACT SWITCH	
	SW802	ESP0001-018	TACT SWITCH	
	SW803	ESP0001-018	TACT SWITCH	
	SW804	ESP0001-018	TACT SWITCH	
	SW805	ESP0001-018	TACT SWITCH	
	SW806	ESP0001-018	TACT SWITCH	
	SW807	ESP0001-018	TACT SWITCH	
	SW808	ESP0001-018	TACT SWITCH	
	SW809	ESP0001-016	TACT SWITCH	
	SW810	ESP0001-018	TACT SWITCH	
	SW811	ESP0001-018	TACT SWITCH	
	SW812	ESP0001-018	TACT SWITCH	
	SW813	ESP0001-018	TACT SWITCH	
	SW814	ESP0001-018	TACT SWITCH	
	SW815	ESP0001-018	TACT SWITCH	
	SW816	ESP0001-018	TACT SWITCH	
	XT601	ECX0008-000KM	RESONATOR	

⚠ : SAFETY PARTS

■ ENB-087 □ Digital Interface Receiver PC Board Ass'y

Note: ENB-087 □ varies according to the areas employed. See note (1) when placing an order.



Note (1)

PC Board Ass'y	Designated Areas
ENB-087 Ⓐ	the U.S.A., Canada
ENB-087 Ⓑ	Australia, Continental Europe, West Germany, the U.K., Other Countries

TRANSISTORS

⚠	ITEM	PART NUMBER	DESCRIPTION	MAKER	AREA
	Q701	DTC144ES	SILICON	ROHM	
	Q702	DTC144ES	SILICON	ROHM	

I. C. S

⚠	ITEM	PART NUMBER	DESCRIPTION	MAKER	AREA
	IC701	YM3623B	I.C.	YAMAHA	
	IC702	TC74HC125AP	I.C.	TOSHIBA	
	IC703	TC74HC04AP	I.C.	TOSHIBA	
	IC704	TC74HCU04AP	I.C.	TOSHIBA	
	IC705	TC74HC86P	I.C.	TOSHIBA	
	IC706	TC74HC123P	I.C.	TOSHIBA	
	IC707	TC74HC393AP	I.C.	TOSHIBA	
	IC708	TC74HC157AP	I.C.	TOSHIBA	
	IC709	SN74LS624N	I.C.	MATSUBOU	
	IC710	NJM3404AS	I.C.	DAINICHI	
	IC711	TC5081AP	I.C.	TOSHIBA	
	IC712	TC74HC04AP	I.C.	TOSHIBA	

DIODES

⚠	ITEM	PART NUMBER	DESCRIPTION	MAKER	AREA
⚠	D701	ERA15-02L19	SILICON	KYOUDOU	
	D702	1SS133	SILICON	ROHM	
	D703	1SS133	SILICON	ROHM	
	D704	1SS133	SILICON	ROHM	
	D705	1SS133	SILICON	ROHM	
	D706	1SS133	SILICON	ROHM	
	D707	1SS133	SILICON	ROHM	
	D708	1SS133	SILICON	ROHM	
	D709	1SS133	SILICON	ROHM	
	D710	1SS133	SILICON	ROHM	
	D711	1SS133	SILICON	ROHM	
	D712	1SS133	SILICON	ROHM	
	D713	MTZ5.6JC	ZENER	ROHM	
	D714	MTZ5.6JC	ZENER	ROHM	
⚠	D715	ERA15-02L19	SILICON	KYOUDOU	

CAPACITORS

⚠	ITEM	PART NUMBER	DESCRIPTION			AREA
	C701	QETB1AM-107	100MF	10V	ELECTRO	
	C702	QETB1AM-107	100MF	10V	ELECTRO	
	C703	QETB1AM-107	100MF	10V	ELECTRO	
	C704	QETB1EM-476	47MF	25V	ELECTRO	
	C705	QETB1EM-476	47MF	25V	ELECTRO	
	C706	QETB1EM-476	47MF	25V	ELECTRO	
	C707	QETB1EM-476	47MF	25V	ELECTRO	
	C708	QETB1EM-106	10MF	25V	ELECTRO	
	C709	QETB1EM-106	10MF	25V	ELECTRO	
	C710	QCZ0205-155	1.5MF	25V	CERAMIC	
	C711	QCZ0205-155	1.5MF	25V	CERAMIC	
	C712	QCZ0205-155	1.5MF	25V	CERAMIC	
	C713	QCZ0205-155	1.5MF	25V	CERAMIC	
	C714	QFN81HK-104	0.1MF	50V	MYLAR	
	C715	QCZ0205-155	1.5MF	25V	CERAMIC	
	C721	QCVB1CM-103	0.01MF	16V	CERAMIC	
	C722	QCB81HK-471	470PF	50V	CERAMIC	
	C723	QCS81HJ-330	33PF	50V	CERAMIC	
	C724	QCS81HJ-330	33PF	50V	CERAMIC	
	C725	QCT30CH-150	15PF	50V	CERAMIC	

CAPACITORS

⚠	ITEM	PART NUMBER	DESCRIPTION			AREA
	C726	QCT30CH-150	15PF	50V	CERAMIC	
	C727	QCVB1CM-103	0.01MF	16V	CERAMIC	
	C728	QCVB1CM-103	0.01MF	16V	CERAMIC	
	C729	QCSB1HJ-330	33PF	50V	CERAMIC	
	C730	QCVB1CM-103	0.01MF	16V	CERAMIC	
	C731	QCSB1HJ-330	33PF	50V	CERAMIC	
	C732	QCVB1CM-103	0.01MF	16V	CERAMIC	
	C751	QER60JM-107	100MF	6.3V	ELECTRO	
	C752	QER60JM-107	100MF	6.3V	ELECTRO	
	C753	QCZ0205-155	1.5MF	25V	CERAMIC	
	C754	QCZ0205-155	1.5MF	25V	CERAMIC	
	C755	QCZ0205-155	1.5MF	25V	CERAMIC	
	C756	QCZ0205-155	1.5MF	25V	CERAMIC	
	C757	QCZ0205-155	1.5MF	25V	CERAMIC	
	C758	QCHB1EZ-223	0.022MF	25V	CERAMIC	
	C759	QCVB1CM-103	0.01MF	16V	CERAMIC	
	C760	QCVB1CM-103	0.01MF	16V	CERAMIC	
	C761	QCT26CH-220	22PF	50V	CERAMIC	
	C762	QEN51HM-105	1MF	50V	NON POLE	
	C763	QCVB1CM-103	0.01MF	16V	CERAMIC	
	C764	QCHB1EZ-223	0.022MF	25V	CERAMIC	
	C765	QCSB1HJ-330	33PF	50V	CERAMIC	

RESISTORS

⚠	ITEM	PART NUMBER	DESCRIPTION			AREA
	R701	QRD167J-822	8.2K	1/6W	CARBON	
	R702	QRD167J-473	47K	1/6W	CARBON	
	R703	QRD167J-473	47K	1/6W	CARBON	
	R704	QRD167J-271	270	1/6W	CARBON	
	R705	QRD167J-105	1M	1/6W	CARBON	
	R706	QRD167J-472	4.7K	1/6W	CARBON	
	R707	QRD167J-183	18K	1/6W	CARBON	
	R709	QRD167J-472	4.7K	1/6W	CARBON	
	R710	QRD167J-183	18K	1/6W	CARBON	
	R713	QRD167J-103	10K	1/6W	CARBON	
	R714	QRD167J-103	10K	1/6W	CARBON	
	R716	QRD167J-103	10K	1/6W	CARBON	
	R717	QRD167J-473	47K	1/6W	CARBON	
	R718	QRD167J-820	82	1/6W	CARBON	
	R719	QRD167J-750	75	1/6W	CARBON	
	R720	QRD167J-100	10	1/6W	CARBON	
	R721	QRD167J-820	82	1/6W	CARBON	
	R722	QRD167J-100	10	1/6W	CARBON	
	R723	QRD167J-750	75	1/6W	CARBON	
	R724	QRD167J-101	100	1/6W	CARBON	
	R725	QRD167J-101	100	1/6W	CARBON	
	R728	QRD167J-221	220	1/6W	CARBON	
	R729	QRD167J-221	220	1/6W	CARBON	
	R730	QRD167J-221	220	1/6W	CARBON	
	R731	QRD167J-221	220	1/6W	CARBON	
	R732	QRD167J-221	220	1/6W	CARBON	
	R733	QRD167J-221	220	1/6W	CARBON	
	R734	QRD167J-221	220	1/6W	CARBON	
	R735	QRD167J-221	220	1/6W	CARBON	
	R736	QRD167J-221	220	1/6W	CARBON	
	R737	QRD167J-221	220	1/6W	CARBON	
	R738	QRD167J-221	220	1/6W	CARBON	
	R739	QRD167J-681	680	1/6W	CARBON	
	R740	QRD167J-681	680	1/6W	CARBON	
	R751	QRD167J-472	4.7K	1/6W	CARBON	
	R752	QRD167J-472	4.7K	1/6W	CARBON	
	R753	QRD167J-222	2.2K	1/6W	CARBON	
	R754	QRD167J-272	2.7K	1/6W	CARBON	
	R755	QRD167J-102	1K	1/6W	CARBON	
	R756	QRD167J-471	470	1/6W	CARBON	
	R757	QRD167J-474	470K	1/6W	CARBON	
	R758	QRD167J-182	1.8K	1/6W	CARBON	

⚠ : SAFETY PARTS

OTHERS

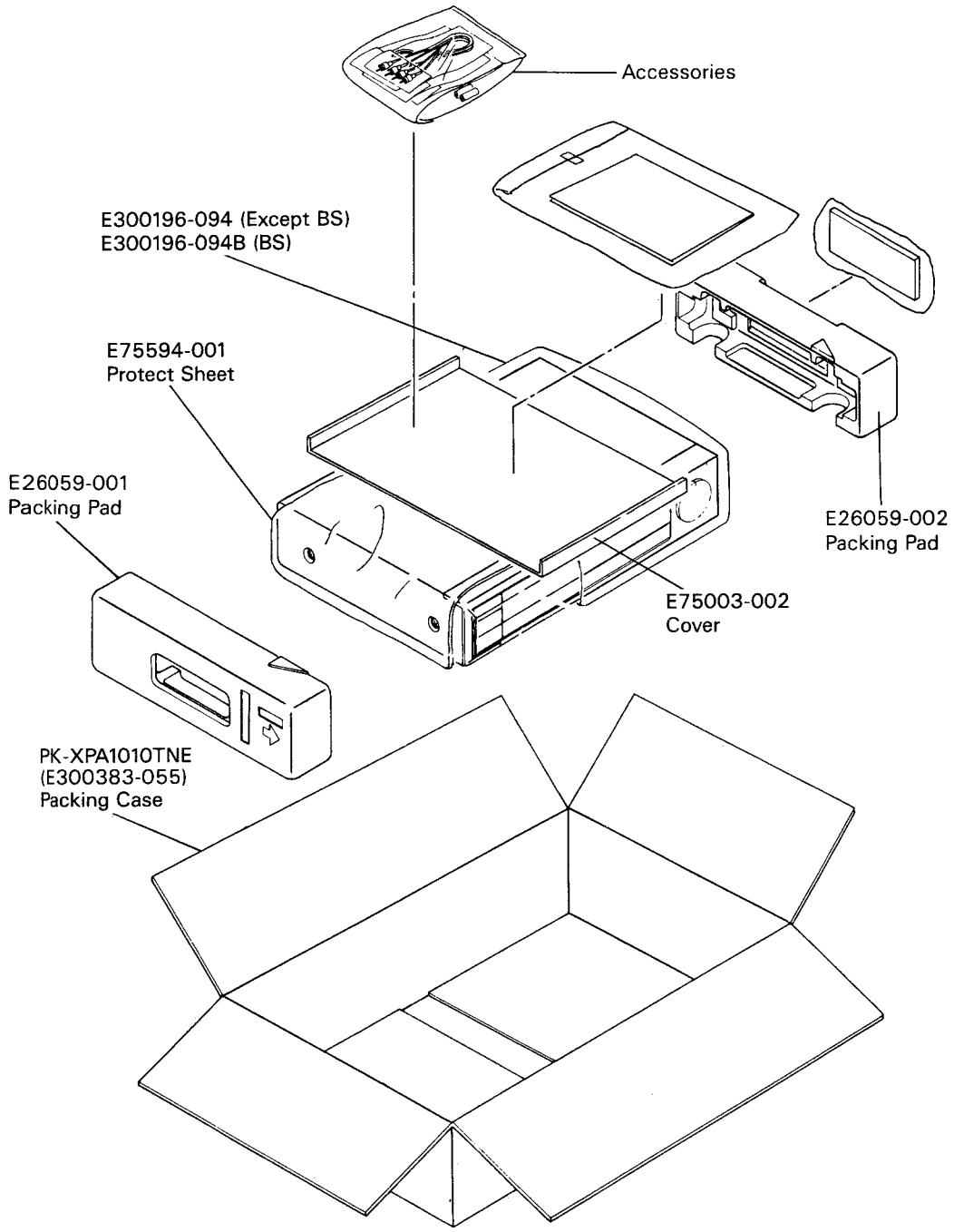
⚠	ITEM	PART NUMBER	DESCRIPTION	AREA
		E12016-001(S)	CIRCUIT BOARD	
	J701	TORX174	OPTICAL JACK	
	J702	TOTX174	JACK	
	J703	EMN00YV-209A	2P PIN JACK	
	J704	EMN00YV-209A	2P PIN JACK	
	J705	EMV7123-019R	CONNECTOR	
	K701	ENZ8101-007	INDUCTOR	
	L701	EQL4004-1R0	INDUCTOR	
	L702	EQL4004-1R0	INDUCTOR	
	L703	EQL4004-1R0	INDUCTOR	
	L704	EQL4004-1R0	INDUCTOR	
	L705	EQL4004-1R0	INDUCTOR	
	P607	E305605-009	CONNECTOR	
	P608	E305605-009	CONNECTOR	
	P705	EMV7123-019R	CONNECTOR	
	T701	ENZ3003-001	COIL	
	T702	ENZ3003-001	COIL	
	EM701	EQF0601-222T	EMI FILTER	
	EM702	EQF0601-222T	EMI FILTER	
	EM703	EQF0601-222T	EMI FILTER	
	EM704	EQF0601-222T	EMI FILTER	
	EM705	EQF0601-222T	EMI FILTER	
	EM706	EQF0601-222T	EMI FILTER	
	EM707	EQF0601-222T	EMI FILTER	
	EM708	EQF0601-222T	EMI FILTER	
	SW701	QSS6A12-E01	SLIDE SWITCH	
	SW702	ESP0001-012	TACT SWITCH	
	XT701	ECX0018-000KS	RESONATOR	

Accessories List

⚠	Part Number	Part Name	Q'ty	Description	Areas
	E30580-1544A	Instruction Book	1		J
	E30580-1545A	Instruction Book	1		Except J,BS
	E30580-1545ABS	Inatruction Book	1		BS
	BT-20048C	Warranty Card	1		J
	BT-20025K	Warranty Card	1		C
	BT20029C	Warranty Card	1		A
	BT20060	Warranty Card	1		BS
	BT-20117	Warranty Card	1		G
	BT20044F	Safety Instruction Sheet	1		J
	BT20108	Service Information Card	1		J
	BT20071A	Service Center List	1		C
	BT20098	Audio Warranty	1	for New Zealand	A
	BT20066A	ECC Agency	1		BS
	QZL1008-001	Information Sheet	1		G
	E35497-019	Caution Sheet	1	220V	U
⚠	E04056	Siemens Plug	1		U
	RM-SXA1010U	Remote Controler	1		
	UM-4NJ-2PSA	Battery	1		
	EWP302-013K	Signal Cord	4		
	TOCP172-1MB-JV	Optical Fiber	1		
	E66416-003	Envelope	1	for Warranty Card	J
	E41202-2	Envelope	1	for Instruction Book	
	E300196-032	Envelope	1		Except BS
	E300196-032B	Envelope	1		BS

⚠ Safety Parts

The Marks for Designated Areas

J·····the U.S.A.
C·····Canada
A·····Australia
E,EF·····Continental Europe
G·····West Germany
BS·····the U.K.
U·····Other Countries
No mark indicates all areas.

Packing Materials and Part Numbers